# SEWING TECHNOLOGY

## NSQF LEVEL - 3

## TRADE THEORY

**SECTOR:** APPAREL

**(As per revised syllabus July 2022 - 1200 Hrs)**

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Directorate General of Training

DIRECTORATE GENERAL OF TRAINING
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
GOVERNMENT OF INDIA

NATIONAL INSTRUCTIONAL MEDIA INSTITUTE, CHENNAI

Post Box No. 3142, CTI Campus, Guindy, Chennai - 600 032

**Sector** : **Apparel**

**Duration** : **1 - Year**

**Trades** : **Sewing Technology - Trade Theory - NSQF Level - 3 (Revised 2022)**

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# FOREWORD

The Government of India has set an ambitious target of imparting skills to 30 crores people, one out of every four Indians, by 2020 to help them secure jobs as part of the National Skills Development Policy. Industrial Training Institutes (ITIs) play a vital role in this process especially in terms of providing skilled manpower. Keeping this in mind, and for providing the current industry relevant skill training to Trainees, ITI syllabus has been recently updated with the help of Media Development Committee members of various stakeholders viz. Industries, Entrepreneurs, Academicians and representatives from ITIs.

The National Instructional Media Institute (NIMI), Chennai, has now come up with instructional material to suit the revised curriculum for **Sewing Technology - Trade Theory - NSQF Level - 3 (Revised 2022)** in **Apparel Sector** under Yearly Pattern. The NSQF Level - 3 (Revised 2022) Trade Practical will help the trainees to get an international equivalency standard where their skill proficiency and competency will be duly recognized across the globe and this will also increase the scope of recognition of prior learning. NSQF Level - 3 (Revised 2022) trainees will also get the opportunities to promote life long learning and skill development. I have no doubt that with NSQF Level - 3 (Revised 2022) the trainers and trainees of ITIs, and all stakeholders will derive maximum benefits from these Instructional Media Packages IMPs and that NIMI's effort will go a long way in improving the quality of Vocational training in the country.

The Executive Director & Staff of NIMI and members of Media Development Committee deserve appreciation for their contribution in bringing out this publication.

Jai Hind

**Ms. TRISHALJIT SETHI,**
Addl. Secretary / Director General of Training
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# PREFACE

The National Instructional Media Institute (NIMI) was established in 1986 at Chennai by then Directorate General of Employment and Training (D.G.E & T), Ministry of Labour and Employment, (now under Directorate General of Training, Ministry of Skill Development and Entrepreneurship) Government of India, with technical assistance from the Govt. of Federal Republic of Germany. The prime objective of this Institute is to develop and provide instructional materials for various trades as per the prescribed syllabi under the Craftsman and Apprenticeship Training Schemes.

The instructional materials are created keeping in mind, the main objective of Vocational Training under NCVT/NAC in India, which is to help an individual to master skills to do a job. The instructional materials are generated in the form of Instructional Media Packages (IMPs). An IMP consists of Theory book, Practical book, Test and Assignment book, Instructor Guide, Audio Visual Aid (Wall charts and Transparencies) and other support materials.

The trade practical book consists of series of exercises to be completed by the trainees in the workshop. These exercises are designed to ensure that all the skills in the prescribed syllabus are covered. The trade theory book provides related theoretical knowledge required to enable the trainee to do a job. The test and assignments will enable the instructor to give assignments for the evaluation of the performance of a trainee. The wall charts and transparencies are unique, as they not only help the instructor to effectively present a topic but also help him to assess the trainee's understanding. The instructor guide enables the instructor to plan his schedule of instruction, plan the raw material requirements, day to day lessons and demonstrations.

IMPs also deals with the complex skills required to be developed for effective team work. Necessary care has also been taken to include important skill areas of allied trades as prescribed in the syllabus.

The availability of a complete Instructional Media Package in an institute helps both the trainer and management to impart effective training.

The IMPs are the outcome of collective efforts of the staff members of NIMI and the members of the Media Development Committees specially drawn from Public and Private sector industries, various training institutes under the Directorate General of Training (DGT), Government and Private ITIs.

NIMI would like to take this opportunity to convey sincere thanks to the Directors of Employment & Training of various State Governments, Training Departments of Industries both in the Public and Private sectors, Officers of DGT and DGT field institutes, proof readers, individual media developers and coordinators, but for whose active support NIMI would not have been able to bring out this materials.

**Chennai - 600 032** **EXECUTIVE DIRECTOR**

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# ACKNOWLEDGEMENT

National Instructional Media Institute (NIMI) sincerely acknowledges with thanks for the co-operation and contribution extended by the following Media Developers and their sponsoring organisation to bring out this IMP **(Trade Theory)** for the trade of **Sewing Technology** under the **Apparel** Sector for ITIs.

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NIMI records its appreciation of the Data Entry, CAD, DTP Operators for their excellent and devoted services in the process of development of this Instructional Material.

NIMI also acknowledges with thanks, the invaluable efforts rendered by all other staff who have contributed for the development of this Instructional Material.

NIMI is grateful to all others who have directly or indirectly helped in developing this IMP.

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# INTRODUCTION

## TRADE THEORY

The manual of trade theory consists of theoretical information for the Course of the **Sewing Technology** Trade Theory NSQF LEVEL - 3 (Revised 2022) in **Apparel**. The contents are sequenced according to the practical exercise contained in NSQF LEVEL - 3 (Revised 2022) syllabus on Trade Theory attempt has been made to relate the theoretical aspects with the skill covered in each exercise to the extent possible. This correlation is maintained to help the trainees to develop the perceptional capabilities for performing the skills.

The trade theory has to be taught and learnt along with the corresponding exercise contained in the manual on trade practical. The indications about the corresponding practical exercises are given in every sheet of this manual.

It will be preferable to teach/learn the trade theory connected to each exercise at least one class before performing the related skills in the shop floor. The trade theory is to be treated as an integrated part of each exercise.

The material is not for the purpose of self learning and should be considered as supplementary to class room instruction.

**Module 1 - Textile and hand work basic operations**

**Module 2 - Sewing machine operation**

**Module 3 - Basic construction**

**Module 4 - Garment part construction**

**Module 5 - Garment construction**

**Module 6 - Measurement of pattern techniques**

**Module 7 - Garment sketching and garment making**

**Module 8 - Production techniques**

**Module 9 - Quality control**

The skill training in the shop floor is planned through a series of practical exercises centred around some practical project. However, there are few instances where the individual exercise does not form a part of project.

While developing the practical manual a sincere effort was made to prepare each exercise which will be easy to understand and carry out even by below average trainee. However the development team accept that there is a scope for further improvement. NIMI looks forward to the suggestions from the experienced training faculty for improving the manual.

## TRADE PRACTICAL

The trade practical manual is intented to be used in practical workshop. It consists of a series of practical exercises to be completed by the trainees during the course of the **Sewing Technology** trade supplemented and supported by instructions/ informations to assist in performing the exercises. These exercises are designed to ensure that all the skills in compliance with NSQF LEVEL - 3 (Revised 2022) syllabus are covered.

This manual is divided into Nine modules. The nine modules are given below.

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| 1.7.38 | Sketching and drafting of the saree and peticoat | | |
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# LEARNING / ASSESSABLE OUTCOME

On completion of this book you shall be able to

| Sl.No | Learning Outcome | Exercise No |
|---|---|---|
| 1 | Make hand stitches in the given fabric following safety precautions. | 1.1.01 - 1.2.16 |
| 2 | Stitch the following using the given fabric: Seams with seam finishes, Darts, Pleats,Tucks, Gathers & Shirrs, Frill, Hem, Casing, Edge Finishing, Neck lines,Placket, **(NOS: AMH/N1948)** | 1.3.17 - 1.3.18 |
| 3 | Pocket, Sleeves, Cuff. | 1.3.19 - 1.4.30 |
| 4 | Fix the fasteners on the given fabric. | 1.4.31 - 1.4.32 |
| 5 | Mend the given fabric.**(NOS: AMH/N1949)** | 1.4.33 |
| 6 | Draft a pattern for Ladies' Suit and sew a Ladies' Suit with the help of the given pattern. **(NOS: AMH/N1947)** | 1.5.34 |
| 7 | Sketch the following garments.<br>• Ladies' Tops/<br>• Short kurties.<br>• Ladies' Suit.<br>• Nightwear (one piece/twopiece).<br>• Sari Blouse.<br>• Dresses for New Born.<br>• Dresses for Toddlers.<br>• Dresses for Kids. **(NOS: AMH/N1211)** | 1.6.35 - 1.7.39 |
| 8 | Construct the following garments with fitting and quality according the sketched designs. **(NOS:AMH/NO701)**<br>• Sari Petticoat. **(NOS:AMH/NO701)**<br>• Ladies' Top / Short kurties. **(NOS:AMH/NO701)**<br>• Ladies' Suit. (NOS:AMH/NO701)<br>• Nightwear (one piece with Yoke). **(NOS:AMH/NO701)**<br>• Nightwear (Two piece- Night Suit). **(NOS:AMH/NO701)**<br>• Dresses for New Born (Jhabla). **(NOS:AMH/NO701)**<br>• Dresses for Toddlers (Sun suit). **(NOS:AMH/NO701)**<br>• Dresses for Kids (Frock). **(NOS:AMH/NO701)**<br>• Gent's Kurta<br>• and Pyjamas. **(NOS:AMH/NO701)**<br>• Gent's Casual<br>• Shirt. **(NOS:AMH/NO701)**<br>• Gent's Trousers. **(NOS:AMH/NO701)** | 1.8.40 - 1.9.47 |

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## SYLLABUS

| Duration | Reference Learning Outcome | Professional Skills (Trade Practical) With Indicative Hours | Professional Knowledge (Trade Theory) |
|---|---|---|---|
| Professional Skill 160 hrs.;<br><br>Professional Knowledge 42 Hrs | Make hand stitches in the given fabric following safety precautions.<br>**(NOS:Not Available)** | 1. Familiarization with the Institute. (25hrs.) | Introduction<br>• Trade<br>• Job Prospects<br>• Safety precautions<br>• First Aid (06 hrs.)<br>• PWD Gender sanitization |
| | | 2. Familiarization & handling of tools. (10hrs.)<br>3. Safety Precautions while handling the tools. (10 hrs.)<br>4. Measurement on dummy (06hrs) | Basic Industrial Terminology Trade related Tools, their importance, usage and safety<br>• Measuring Tools<br>• Drafting Tools<br>• Marking Tools<br>• Cutting Tools<br>• Sewing Tools<br>• Finishing Tools (06 hrs.) |
| | | 5. Identification of fabrics and texture. (10 hrs.)<br>6. Handling of Fabrics. (15 hrs.)<br>7. Making weave samples. (20 hrs.)<br>8. Market survey and Swatch file | Fabric Fundamentals<br>• Brief idea about fibers<br>• Types of Fabrics<br>• Selection of Needle and thread according to fabric types<br>• Broken Needle Policy Fabric Preparation for cutting<br>• Fabric Grain<br>• Selvedge<br>• Shrinkage<br>Straightening the fabric Grains<br>• Measurements<br>• Units<br>• Measuring Techniques (06 hrs.)<br>• Define the Problem &Research Object<br>• Developing Marketing Research Planning<br>• Collect Needed Information<br>• Implementing Marketing Research Plan (06 hrs.) |

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| | | **Practice on Industrial Single needle lock stitch Sewing Machine**<br>9. Ergonomic principle of sitting on sewing machine. (8 hrs.)<br>10. Speed Control. (5 hrs.)<br>11. Practice on paper. (8hrs.)<br>12. Threading of machine. (10 hrs.)<br>13. Bobbin winding &loading. (5 hrs.)<br>14.Practice on fabric. (8hrs.) | Basic Sewing Machine<br>• Parts and functions<br>• Machine needle<br>• Stitch formation<br>• Sewing machine practice<br>• Care and maintenance<br>• Trouble-Shooting<br>• Types of Industrial Sewing Machine(12 rs.) |
| | | 15.Running on (10 hrs.)<br>• Straight lines<br>• Square<br>• Zigzag lines<br>• Circle<br>• Semicircle<br>• Spiral.<br>16. Practice on Over lock machine<br>• Threading<br>• Running<br>• Minor adjustments. (10hrs.) | Over lock machine<br>• Parts and functions<br>• Machine practice<br>• Care and maintenance<br>• Trouble Shooting<br>Basic Garment Analysis (06 hrs.) |
| Professional Skill 230Hrs;<br><br>Professional Knowledge 60 Hrs | Stitch the following using the given fabric: Seams with seam finishes, Darts, Pleats, Tucks, Gathers & Shirrs, Frill, Hem, Casing, Edge Finishing, Neck lines,<br>Placket,<br>**(NOS: AMH/N1948)** | 17. Practice of making Seams (15hrs.)<br>• Plain Seam (Straight &Curved) with seam finishes<br>• Self-Enclosed seams<br>• Top stitched seams<br>• Corded Seam<br>• Decorative seams<br>18. Practicing with Sewing Aids. (5 hrs) | Seams<br>• Classification<br>• Uses<br>• Properties of Seams<br>• Seam finishes Sewing Aids<br>• Presser foots<br>• Folders<br>• Guides (06 hrs.) |
| | Pocket,<br>Collar, Sleeves,<br>Cuff. | 19. Making Samples of· Darts Pleats. (15hrs.) | Introducing Fullness·<br>• Darts – Necessity, type & precautions during stitching·<br>• Pleats – Necessity, type & uses (06 rs.) |

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| | | | |
|---|---|---|---|
| | | 20. Making Samples of<br>• Tucks<br>• Gathers and Shirrs<br>• Frills. (10hrs.)<br><br>21. Practice of Hand stitches & Making Samples of them. (10hrs.) | Introducing Fullness<br>• Tucks - Types &use<br>• Gathering and Shirring<br>• Flare<br>• Ruffles/Frills - Types (Straight & Circular) &uses<br>Hand stitches<br>• Hand needles - Size &types<br>• Sewing Thread<br>• Types & Applications of hand stitches (06 hrs.) |
| | | 22. Making samples of<br>• Faced Hem<br>• Edge stitched hem<br>• Double stitched hem<br>• Band hem<br>• Ease in ahem<br>• Mitered hem. (10hrs.)<br>23. Practice of the corner makings<br>• Self-turned<br>• With additional strip. (10 hrs.) | Hems<br>• Types<br>• Uses<br>Corner Makings<br>• Types<br>• Uses (06 hrs.) |
| | | 24. Making samples of:<br>• Casing with Drawstring<br>• Casing with elastic<br>• Casing with heading<br>• Inside applied casing<br>• Outside applied casing.<br>(20 hrs.)<br>25. Making samples of edge finishing:<br>• Bias facing<br>• Combination shaped facing<br>• Outside facing<br>• Self-facing<br>• Shaped facing<br>• Binding<br>• Piping (30 hrs.) | Casing<br>• Introduction<br>• Use<br>Edge Finishing<br>• Facings<br>• Bindings<br>• Pipings (06 hrs.) |

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| | | 26. Making samples of different shaped necklines. (25 hrs.) | Necklines<br>• Different shapes of neckline |
| | | 27. Making samples of Plackets: (25 hrs.)<br>• Faced Placket<br>• Continuous Placket<br>• One Piece Placket<br>• Two Piece Placket<br>• Two piece Placket with pleat<br>• Zippered Placket<br>➢ Lapped<br>➢ Fly Front<br>➢ Open End<br>➢ Invisible<br>➢ Visible | Plackets<br>• Types<br>• Sample makings (06 hrs.) |
| | | 28. Making samples of different Pockets<br>• Patch<br>• Inseam<br>• Cut/slash(25. hrs.) | Pockets<br>• Types<br>• Design variations (06 hrs.) |
| | | 29. Samples of making Collars. (15hrs)<br>30. Samples of making Sleeves. (15hrs) | Collars<br>• Classification<br>• Collar terms<br>Sleeves<br>• Classification<br>• Sleeve length variation<br>• Sample making of Sleeves with and without cuff. (06 hrs.) |
| Professional Skill 10Hrs;<br>Professional Knowledge 06Hrs | Fix the fasteners on the given fabric.<br>**(NOS:Not Available)** | 31. Practice of fixing fasteners as Buttons, Hooks, Eyes, Press Studs. (6 hrs.)<br>32. Practice of making Button holes by Hand. (4 hrs.) | Trimmings<br>• Types<br>• Applications<br>• Fixing of Buttons, hooks etc.<br>• Making of Button hole (06 hrs.) |

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|---|---|---|---|
| Professional Skill10Hrs; Professional Knowledge 06Hrs. | Mend the given fabric. **(NOS: AMH/N1949)** | 33. Practicing Darning and Patching. (10 hrs.) | Mending· Darning· Patching (06 hrs.) |
| Professional Skill 30Hrs;<br><br>Professional Knowledge 12Hrs | Draft a pattern for Ladies' Suit and sew a Ladies' Suit with the help of the given pattern. **(NOS: AMH/N1947)** | 34. Stitching of Ladies suit. (30 hrs.) | Drafting & developing Pattern for Ladies suit. (12 hrs.) |
| Professional Skill 140 hrs.;<br><br>Professional Knowledge 42 Hrs | Sketch the following garments.<br>• Ladies' Tops/ Short kurties.<br>• Ladies' Suit.<br>• Nightwear (one piece/ two piece).<br>• Sari Blouse.<br>• Dresses for New Born.<br>• Dresses for Toddlers.<br>Dresses for Kids.<br>**(NOS: AMH/N1211)** | 35. Practice of taking Body Measurements. (20 hrs.)<br>• Alteration of garment as per requirement of customer | Human Figures<br>• Eight Head Theory<br>• Brief introduction about Joints and Muscles<br>• Types of Figures Body Measurements<br>• Importance<br>• Types & measuring Techniques<br>• Precautions<br>• Measurement Charts (06 hrs.) |
| | | 36. Practicing different types of layout using the given patterns. (20 hrs.) | Patterns<br>• Importance<br>• Pattern Information<br>• Types of Spreading & Pattern Layout<br>• Importance<br>• Spreading methods/machines<br>• Types of layout Pattern Drafting<br>• Drafting/Pattern Terminology<br>• Principles of Pattern drafting (06hrs.) |
| | | 37. Pattern Making, Fabric Estimation, Cutting, Sewing, Pressing & Folding of Sari Petticoat. (60hrs)<br><br>38. Checking the Fitting of the garment. (10 hrs.) | Pressing<br>• Tools<br>• Methods Importance of Pressing Trial Room<br>• Necessity<br>• Specification<br>Sketching and drafting of Sari Petticoat. (24 hrs.) |

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| | | | |
|---|---|---|---|
| Professional Skill 260Hrs;<br><br>Professional Knowledge 72Hrs; | Construct the following garments with fitting and quality according the sketched designs. **(NOS:AMH/NO701)**<br>• Sari Petticoat. **(NOS:AMH/NO701)**<br>• Ladies' Top / Short kurties. **(NOS:AMH/NO701)**<br>• Ladies' Suit. **(NOS:AMH/NO701)**<br>• Nightwear (one piece with Yoke). **(NOS:AMH/NO701)**<br>• Nightwear (Two piece-Night Suit). **(NOS:AMH/NO701)**<br>• Dresses for New Born (Jhabla). **(NOS:AMH/NO701)**<br>• Dresses for Toddlers (Sun suit). **(NOS:AMH/NO701)**<br>• Dresses for Kids (Frock). **(NOS:AMH/NO701)**<br>• Gent's Kurta and Pyjamas. **(NOS:AMH/NO701)**<br>• Gent's Casual Shirt. **(NOS:AMH/NO701)**<br>• Gent's Trousers. **(NOS:AMH/NO701)** | 39. Practice on special industrial sewing machines - (30 hrs.)<br>• Double Needle Machine<br>• Button Hole Machine<br>• Button Sewing Machine<br>• Multipurpose Machine (Zigzag)<br>• Bar Tack machine<br>• Feed off the Arm Double Needle | Mass Production Process -<br>• Sequence of operations<br>• Types of cutting machines<br>• Fusing Technology<br>• Types of Industrial Machines Used in sewing section<br>• Finishing (06 hrs.) |
| | | **Ladies Wear**<br>40. Pattern Making, Fabric Estimation, Cutting, Sewing, Pressing & Folding of the following garments with design variations<br>• Ladies Tops/Short kurties<br>• Ladies suit<br>• Night wear (one piece/two piece)<br>• Simple Ladies Sari blouses (60 hrs.)<br>41. Checking the Fitting of the garment.(10 hrs) | Sketching and drafting of the following garments-<br>• Ladies Tops/Short kurties<br>• Ladies suit<br>• Night wear (one piece/ two piece)<br>• Sari blouses (18 hrs.) |
| | | **Kids Wear**<br>42. Pattern Making, Fabric Estimation, Cutting, Sewing, Pressing & Folding of the following garments with design variations<br>• Dresses for newborn<br>• Dresses for Toddler<br>• Dresses for Kids. (55 hrs.)<br>43. Checking the Fitting of the garment. (10 hrs.). | Sketching and drafting of the following garments-<br>• Dresses for newborn<br>• Dresses for Toddler<br>• Dresses for Kids (24 hrs.) |
| | | **Gents Wear**<br>44. Pattern Making, Fabric Estimation, Cutting, Sewing, Pressing & Folding of the following garments with design variations<br>• Kurta & Pyazama<br>• Casual Shirts &Trousers (90 hrs.)<br>45. Checking the Fitting of the garment.(15hrs.) | Pattern Making, Fabric Estimation, Cutting, Sewing, Pressing & Folding of the following garments with design variations<br>• Kurta & Pyazama<br>• Casual Shirts &Trousers (24 hrs.) |
| | | 46. Methods of removing different kinds of stains in fabrics. (10 hrs.)<br>47. Checking of garments in respects of –(10 hrs.)·<br>• Measurements·<br>• Stitching·<br>• Stains·<br>• Defects·<br>• Correcting measures. | Laundry Stains<br>• Classification<br>• Removing techniques<br>Quality Control<br>• Definition, need &planning<br>• Types of Inspection<br>• Stages of Inspection<br>• Role of Quality Controller (06 hrs.) |

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# Trade introduction

**Objectives:** At the end of this lesson you shall be able to
- **explain the role of dresses**
- **name the prospects of the trade**
- **explain the safety precautions**
- **explain the firstaid procedures**
- **explain the importance of sanitization.**

**Trade Introduction**

**Role of clothes:** Besides food and shelter clothes are the basic necessities of human life. Three main functions for clothes can be stated:

**Protection:** Clothes cover nudity or nakedness of men and women. They protect against injuries while working or during other activities.

**Decoration:** Clothes have also decorative function. People wear different dresses in different situations. A day to day dress will look different from dresses worn in auspicious function. The decorative aspect is also used to give an individual touch to the person wearing the dress.

**Identification:** This function of dresses characterises people as part of a special group or society. Pesant costumes and national dresses as well as uniforms of policemen or students may serve as examples.

**Scope and prospects of the trade:** People started wearing unstitched dresses, i.e. fur and coat of animals and woven pieces of fabrics which were draped around the body.

Stitched garments for upper and lower body necessitate cutting and tailoring of fabrics. Fashion creates lots of new dresses. Fashion parades are conducted throughout the world. The style of saree blouse and ladies' shirts change according to the shape and decoration. This is the reason why the different trades of dressmaking have good prospects in the future.

The work in the dressmaking field involves a multitude of activities.

Stitching dresses for you and your family at home and employment in tailor's shop require your skills for pattern making, cutting and stitching of the components.

Working in industry normally means that many dresses are produced from one pattern. Here you are working in a highly specialised section of production where many layers of fabric are cut and parts are assembled with the help of highly sophisticated machinery.

To set up your own business like tailor shops for example you have to do some investment for machinery and tools; if you don't have own property you have to rent a room where you can set up your production. You need skills to calculate costing, estimate materials etc.

Job Opportunities (Job prospects: Job opportunities in this sector;

1 Tyler / Machine Operator Most of the garment manufacturing division will be operated by machine operators.

2 Besfok Taylor Men's Tailors Fesbok Dresses are fully integrated and unique to each customer

3 Favorite clothing makers generally match women's favorite wedding dresses, dresses, suits, gowns etc.

4 Baton Makers Drawing patterns and patterns on paper (or) Designing suede fabrics with computer auto gate software.

5 The tax ratio for designers clothing is created by designers with color and texture combinations.

6 Cosmetic Consultant will recommend clothing, style and color suitable for fashion clients.

7 Tweakers are adjusters who are fully prepared to wear the clothes.

**Safety Precautions:** Safety is important to all and it is our responsibility to maintain a safe workspace. To maintain a safe environment everyone should explore safety rules and practice them at all times.

**Health and safety precautions**

**Health**

1 Keep hands away from the needle when the machine is operating.

2 Do not place your fingers into the thread take up lever while machine is operating.

3 Never leave the machine running and unattended to avoid accidents.

4 During operation, never place your head, hair or hands in the proximity of hand wheel. V-belt bobbin winder or balance wheel.

5 Do not operate the machine with any safety guards removed.

6 The machine should only be used by trained persons.

7 If oil grease comes in contact with eyes or skin, immediately wash the affected area and consult a physician.

8 Pass sharp objects, handle first to another person.

9 Do not leah your face to close when stitching in case the needle breaks.

10 Do not touch hot iron except on the handle.

**Safety**

1 Keep pins in a pin cushion, never in clothes.

2 Keep shears and scissors in closed position when not using.

3 Carry all sharp and pointed tools or objects with the sharp end in a downward position.

4 Use a slow speed when learning how to use the machine.

5 Children should not allowed while working in the machine. Do not let them handle machines and tools.

6 When not in use, tools must be stored in a dry location to inhabit rust. Always lock up tools and keep out of reach of children.

7 Do not wear loose clothing or jewellery as they can be caught in moving parts.

8 Keep proper footing and balance at all times. Do not reach over or across running machines.

9 Watch what you are doing, do not operate when you are tired.

10 before using and product, any part that appears damaged should be carefully checked determine that it will operate properly and perform its intended function.

**Care, maintenance and storage**

1 For your safety, service and maintenance should be performed regularly by a qualified technician.

2 Do not handle the machine or its tools roughly.

3 Use only the branded or recommended machine parts to avoid the damage of machines.

4 Keep needles sharp and tools clean for better and safer performance.

5 Clean the machine with a clean, damp cloth. Don't use solvents or thinners.

6 When not in use, cover the machine and store in a clean and dry location.

7 Clean areas at the end of each class or working. Sweeping the floors, wiping off work surfaces to pick up lint, thread clippings and fibers.

8 When servicing, use only identical replacement parts. Use of any other parts will void the warranty.

9 Use naphthalene balls at cloth cupboards to prevent damage of fabric by insects.

10 Do not dry clothes in sun light continuously for more time, as it will damage the fabric soon.

11 Always place the pins used for pattern works in a pin cushion.

12 Store the necessary tools like screw drivers and oil can in the machine tool box.

13 Keep all the sewing threads in a thread box.

14 Maintain a needle box set with all types and sizes of needles used for stitching.

15 Keep all the sharp tools like scissors, shears, trimmers in a safe place and also with in reach.

**Tools and equipments - sewing**

**Needles**

1 Use the suitable needle for suitable hand stitches.

2 Fix the machine needle - flat needle at the flat side of the needle bar.

3 Use only sharp needles.

**Thread**

1 Do not thread too lengthly threads for hand stitches.

2 Don't use old or damp threads.

3 Place the thread spool in correct direction to assure free flow of thread while sewing.

**Scissors**

1 Use scissors for cutting paper pattern, handle them with care.

2 Trim threads and cut light fabrics like seam allowances using scissors, before cutting.

**Shears**

1 Hold the shears with the thumb in the smaller ring and the other fingers on the other used to cut 2 to 4 layers of fabric.

2 While cutting follow the pattern lines and use only sharp shears.

**Chalk**

1 Use marking chalk to suit the colour of he fabric.

2 Always mark using chalk on the wrong side of the fabric.

**Thimble**

1 Wear thimble while working hand stitches.

2 Use thimble of suitable size for your fingers.

**Measuring tape**

1 Always follow any one of the measurement centimeters or inches.

2 Make sure while measuring that the zero point of the tape is placed exactly at the point of the measurement.

**Seam ripper**

1 Do not use seam ripper for any other purpose than what it is intended.

2 handle them with care to trim the unwanted short threads stitching the garment.

**Thread**

1 Use hole maker to pierce holes for making eyelet stitches.

2 Do not use this to make holes in any other hard maten as it will blunt its sharp edges.

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**First Aid**

First aid is the first and immediate assistance given to any person with either a minor or serious illness or injury,[1] with care provided to preserve life, prevent the condition from worsening, or to promote recovery. It includes initial intervention in a serious condition prior to professional medical help being available, such as performing cardiopulmonary resuscitation (CPR) while waiting for an ambulance, as well as the complete treatment of minor conditions, such as applying a plaster to a cut. First aid is generally performed by someone with basic medical training.

The primary goal of first aid is to prevent death or serious injury from worsening. The key aims of first aid can be summarized with the acronym of 'the three Ps:

**Preserve life:** The overriding aim of all medical care which includes first aid, is to save lives and minimize the threat of death. First aid done correctly should help reduce the patient's level of pain and calm them down during the evaluation and treatment process.

**Prevent further harm:** Prevention of further harm includes addressing both external factors, such as moving a patient away from any cause of harm, and applying first aid techniques to prevent worsening of the condition, such as applying pressure to stop a bleed becoming dangerous.

**Promote recovery:** First aid also involves trying to start the recovery process from the illness or injury, and in some cases might involve completing a treatment, such as in the case of applying a plaster to a small wound.

It is important to note that first aid is not medical treatment and cannot be compared with what a trained medical professional provides. First aid involves making common sense decisions in the best interest of an injured person.

**First aid policy and procedures**

- To encourage and promote a safe work environment with manageable stress levels.
- On the first aid box there are the names of the authorized persons who have proper security training to medicate someone when necessary.
- The box should be kept locked to make sure that, none of the medicines and equipments are being misused or stolen.
- The supplies for the first aid boxes will be regularly checked by the authorized persons to make sure that, sufficient supplies are there and those are not expired.
- In case of any sort of severe injuries which can not treated with the first aid supplies in that case the employee should be taken to in house doctor quickly, if not available then to take to the nearest hospital.
- The first aid box will be kept at the place where people of one specific floor can easily come and take the help of the authorized persons to treat the initial injuries.
- Every week the authorized persons will scrutinize the first aid boxes to make sure the availability of the sufficient supplies and if required they will inform to the welfare department . Welfare department will purchase the necessary supplies for the first aid boxes and maintain the first aid policy and procedures.

**What is Sanitization?**

Sanitization is a process of cleaning certain area or surface in such a manner so that it is made bacteria-free and elementally clean all types of microbes and viruses that can infect the human body and cause different kinds of diseases.

Hand Sanitization is a process of cleaning the human body especially hands that can get infected with any contagious microbes when the hands touch any infected surfaces, animals, or humans.

Surface Sanitization is a process of removing or destroying microorganisms from places like clothing, vegetables, water, and all kinds of hard surfaces.

That is to say, sanitization is a process of removing harmful microbes with the help of chemicals that doesn't harm the human body. The chemicals are used in measured quantities and diluted with water or other diluting agents. Sanitization can also be done with the help of heat and some other methods but that cannot be applied in every context.

**The Difference Between Cleaning and Sanitization**

Many people feel that 'Cleaning' and 'Sanitization' are the same thing. However, this is not true. Though cleaning is the first step in the sanitization, mere cleaning cannot sanitize a place or our hands. Let us take a closer look at the differences between the two terms:

- Cleaning is often the first step that removes the dirt and dust from a certain surface top. Sanitization is the next step that aims at deeper cleaning.
- Cleaning is a regular task that can be done by anyone but sanitization is a highly professional task that requires knowledge, experience, and expertise.
- The chemicals, agents, and the equipment used for cleaning are very simple and basic. They can be easily arranged. Using them is also very simple and easy. In the case of sanitization, the products are much more complex. People using them must have enough knowledge of using the right chemical in the right place so that the pathogens and the bacteria are killed and the surface top is not damaged in any way.
- Cleaning aims at removing the dirt particles but sanitization aims at killing the bacteria and the pathogenic elements that can cause diseases

**The Importance of Sanitization**

**Importance of Hand Sanitization in Our Daily Routine**

Sanitizing hands keep us and our families healthy. With the hand, we touch hundreds of things knowingly and unknowingly that can infect us with hundreds of microbes. This is why hand sanitization is important. Here again, just cleaning doesn't mean the germs are killed. We need

to know the process of hand sanitization. The medical fraternity has acknowledged that a majority of germs, bacteria, and other pathogenic harmful microorganisms enter our system through our hands. Throughout the day we touch a number of surfaces of which many could be polluted with bacteria, fungi, and viruses. Now, touching our eyes, nose, and mouth with these hands can make us sick in more ways than one. This is why washing and sanitization of hands are of paramount importance for our unfailing health. The different surfaces with which we come in contact at home, office, personal or public vehicles, and public spaces are some of the most susceptible places through which microbes spread rapidly in healthy individuals. This is why the sanitization of touchable surfaces is more than imperative to stop the spread of dangerous and contagious diseases.

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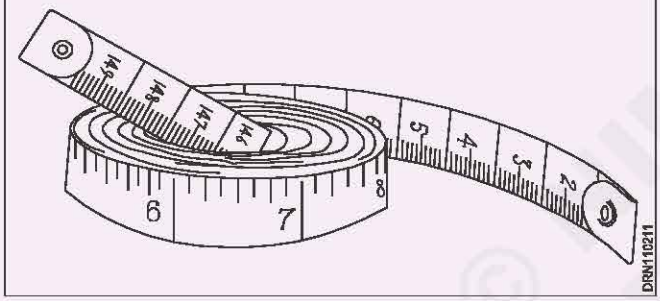
# Tools and Equipments

**Objectives:** At the end of this lesson you shall be able to

- **state various types of**
  - **measuring tools**
  - **drafting tools**
  - **marking tools**
  - **cutting tools**
  - **sewing tools.**

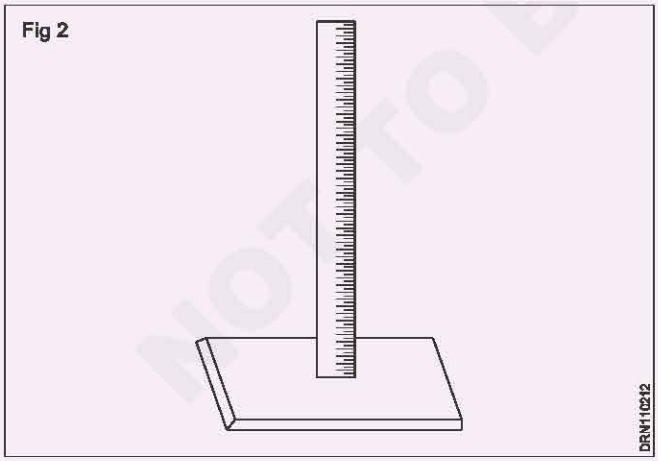
**Measuring tape:** Flexible fiber glass or fabric measuring tape that is ideal for taking body measurements, measuring patterns and layouts as well as general measuring. Fabric types tend to stretch after prolonged uses. It has marks of inch and centimeter only. Its width is 5 points. It is a measuring ribbon made on scientific base knowledge about the use of fundamental for tailoring. (Fig 1)

Fig 1




**Measuring stand:** This stand is used to measure long garments as over coat, ladies nighty, gown etc., as well as to check the flare of enriched garments. (Fig 2)

Fig 2




**Metal tape:** It is convenient and flexible for measuring form or figure. It is made of flexible metal. (Fig 3)

**Drafting tools**

**'L' scale:** It is made up of wood or iron, it is called try square also. Its one arm is 12" in length and another is 24" in length. Each inch contains 8 marks. Wooden try square is used in tailoring. Fig 4.

**Graduated square:** It is also 'L' square scale, but here inch mark are given on the one side and on the other side with ½" marks are in the denomination of ¼, 1/7, 1/16, 1/32 and ride with 24" marks are in the denomination 1/3, 1/6, 1/12, 1/24, 1/48. These marks are used for drafting the patterns (Fig 5).

Fig 3

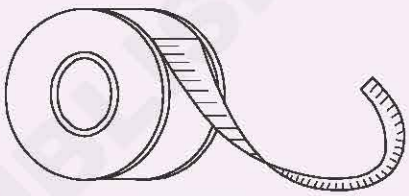



Fig 4

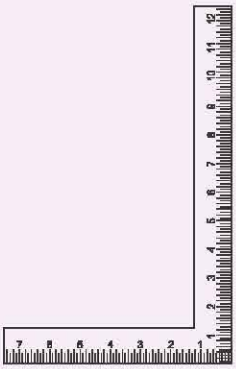
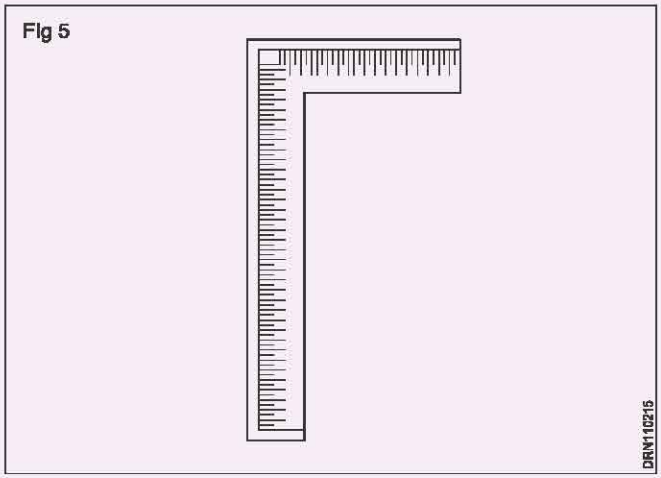



Fig 5




**Measuring stick:** It has marks of inch and centimeters. It is flexible stick used for checking the grains of the fabric and marking the hems (Fig 6).

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Fig 6



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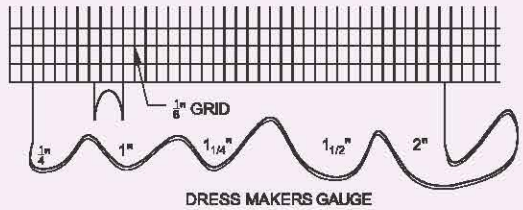
**Dress marker's gauge:** It has one side with scallop edges and the other side with straight edges. Scallop edge side contains ¼", 1", 11/4", 11/2", 2" where as the other side with straight edge contains 1", 2", 3", 4". Scallop edges used for measuring pleats, tucks etc., and straight edges are used for measuring the button holes (Fig 7).

Fig 7

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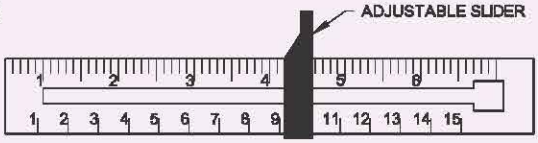
**Seam gauge:** Seam gauge is 6" ruler with a sliding rod marker has many uses. It is used to mark seam margin lengths, buttons and button holes as well as design details such as pleats and tucks (Fig 8).

Fig 8

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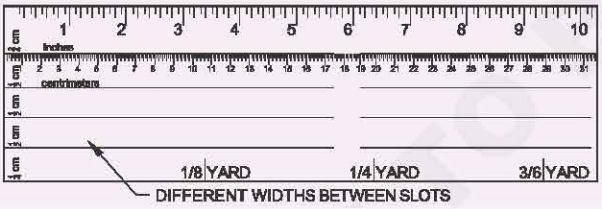
**Transparent ruler:** It is made of plastic, it has marks of inches and centimeters. It is used for measuring straight or bias lines (Fig 9).

Fig 9

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**T – square:** It is transparent with easy to read the markings. It has marks of inches and centimeters. It is used for measuring the square off straight edges (Fig 10)

**Set square:** Set square made of crystal clear, shatter proof synthetic material, metal or wood. They are used in the design and pattern departments (Fig 11).

**Card scale:** It is made up of paper card board. It is commonly used for small drafting in the record note books (Fig 12).

**Tailor's art curve:** It is made up of wood, plastic and steel. It is also of 'L' shape but other side is closed also and is curved in circles. It contains marks of ½ centimeter on the one side and that of 1/5 centimeter on the other side (Fig 13).

Fig 10

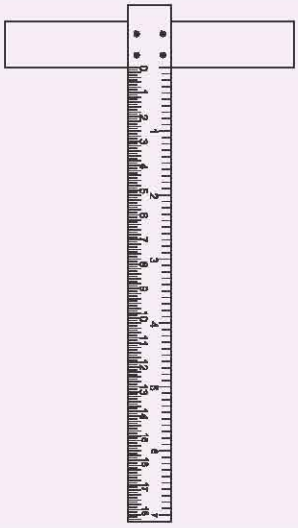

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Fig 11

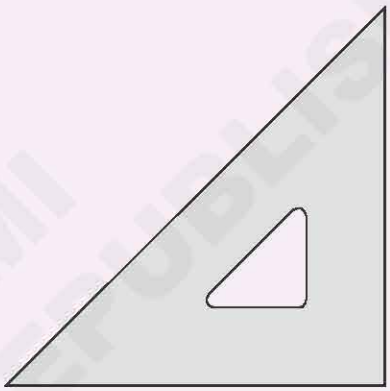


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Fig 12

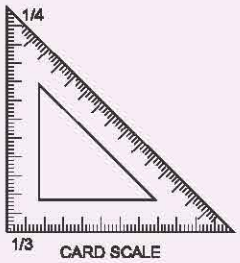


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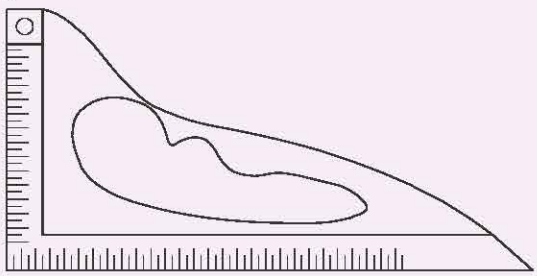
Fig 13



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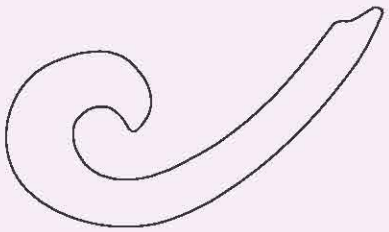
**French curve:** These are made up of transparent plastic. It is a set of 12 tools in tailoring only 3 or 4 is commonly used. It helps in drawing the shapes of neck, armhole depth, side and bottom (Fig 14).

Fig 14



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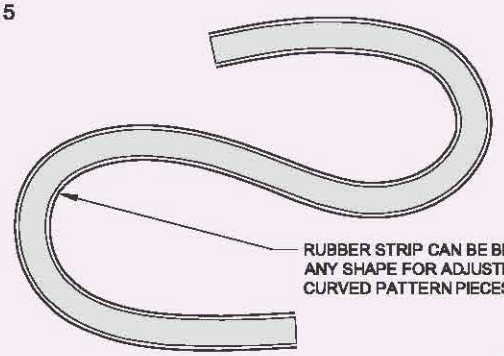
**Flexible curve:** These are made of flexible rubber. It can be bent into any shape of adjustments to curved pattern pieces (Fig 15).

Fig 15




FLEXIBLE CURVE

DRN11021F

**Hip curve or Curve rulers:** It is made of wood or plastic. It is a slightly circled rod, it is used for drafting the side shape like shirt, pants etc., (Fig 16)

Fig 16

HIP CURVE

DRN11021G

**Long rule:** It has marks of inch and centimeter. It is used for drawing the straight lines. (Fig 17)

Fig 17

DRN11021H

**Compass:** It is made of metal and it is used for drawing circles and arcs, in tailoring it helps only for make curve in an umbrella frock. (Fig 18)

**The most common drafting tools**

**Tailor's chalk:** This is available in many forms at sewing motions. Tailor's chalk is hard chalk is used to make temporary markings on cloth.

Marking pen may be self erasing after 2 to 8 days or can be removed either by wash or by ironing. It is useful for marking on the top of the cloth eg. Pocket position (Fig 19).

Fig 18

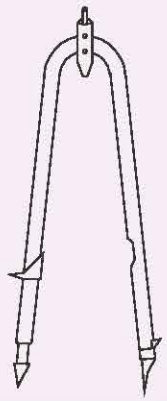


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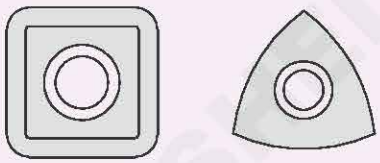
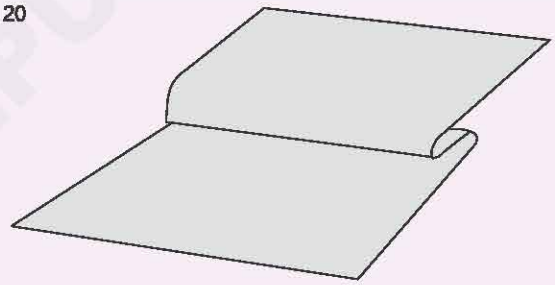
Fig 19



DRN11021J

**Tracing paper:** Tracing paper is named as such for its ability for an artist to trace an image onto it. When tracing paper is place onto a picture, the picture is easily viewable through the tracing paper. (Fig 20)

Fig 20



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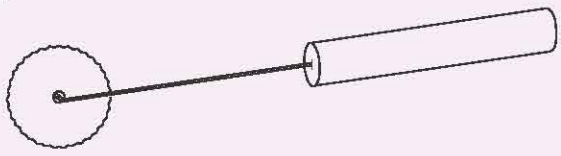
**Tracing wheel:** A tracing wheel is with serrated teeth on a wheel attached to a handle used to transfer markings from pattern on to fabric with or without tracing paper. Such markings might include pleats, darts, button holes or placement lines for appliances or pockets.

There are two basic types of tracing wheels are available to the modern sewing machine one with a serrated edge and one with a smooth edge. (Fig 21)

Fig 21



TRACING WHEEL

DRN11021L

**Cutting table and cutting board:** Cutting table is 6 feet wide and 3 feet, 3 feet height. People who work in standing position use table and those who work in sitting position use board. (Fig 22)

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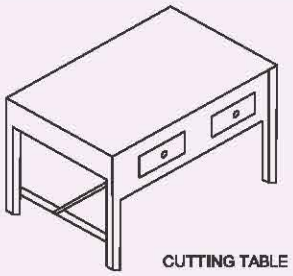
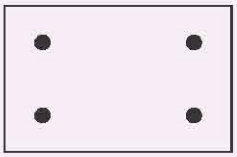
Fig 22



CUTTING TABLE



CUTTING BOARD

DRN11021M

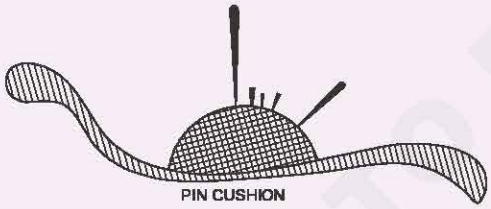
**Pins:** Straight pins range in length from ½" to 1 7/8" look for sharp, smooth, rustproof pins that can bend with out breaking. (Fig 23)

Fig 23

DRN11021N

**Pin cushions:** Pin cushions are in variety of styles. It sharpens and cleans pins and needles, a rectangular, wrist band pin cushions mounted on a plastic wrist band that is perfect for pin filling and marking hems and magnetic 'grabber' types net marks for easy pin catching. (Fig 24)

Fig 24



PIN CUSHION

DRN11021O

**Dress form (Fig 25):** Dress form is used to give a three dimensional view on the article of clothing that is being sewed. They come in all sizes and shapes for almost every article of clothing can be made.

When a piece of clothing is made it can be put on the dress form so one can see how the piece of clothing will turn out. Then one can make alterations up on the clothing on appearance of the dress form.

**Needle threader:** A needle threader is a small device for helping the thread through the eye of small needles. Most familiar today is the needle threader of Victorian design consisting of a small tinned plate stamped with queen's head and with a diamond shaped steel wire attached. (Fig 26)

**Thimble:** Made of metal, rubber or plastic. This small protective cover slips over the index or middle finger. When hand sewing or quilting a thimble protects the finger tip from pin pricks and it is used to push the needle through multiple layer of fabric. (Fig 27)

Fig 25

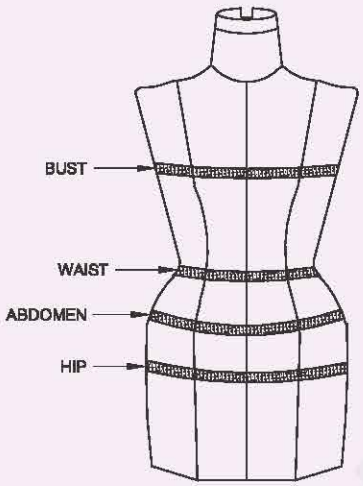



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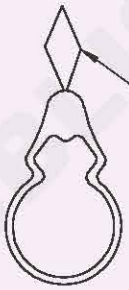
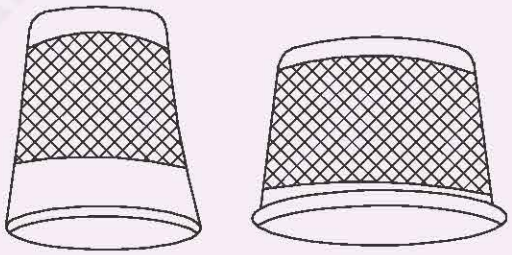
Fig 26



WIRE IS INSERTED INTO NEEDLE EYE

DRN11021Q

Fig 27



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**Sewing needles:** A sewing needle is a long slender rods with a pointed tip. A needle for hand sewing has a hole called the eye at the non - pointed end to carry thread or cord through the fabric after the pointed end pierces it. Needle rings is defined by a number on the packet.

The convention for sizing is that the length and thickness of a needle increase as the size number decreases. For example, a size 1 needle will be thicker and longer, while size 10 will be shorter and finer. (Fig 28)

**Sewing needles:** Sewing needles are classified by their length and thickness. The usual types are "standard" and "long" (Fig 29).

The numbering system is not directly related to the lenth or thickness of the needles; it serves only to distinguish one needle from another.

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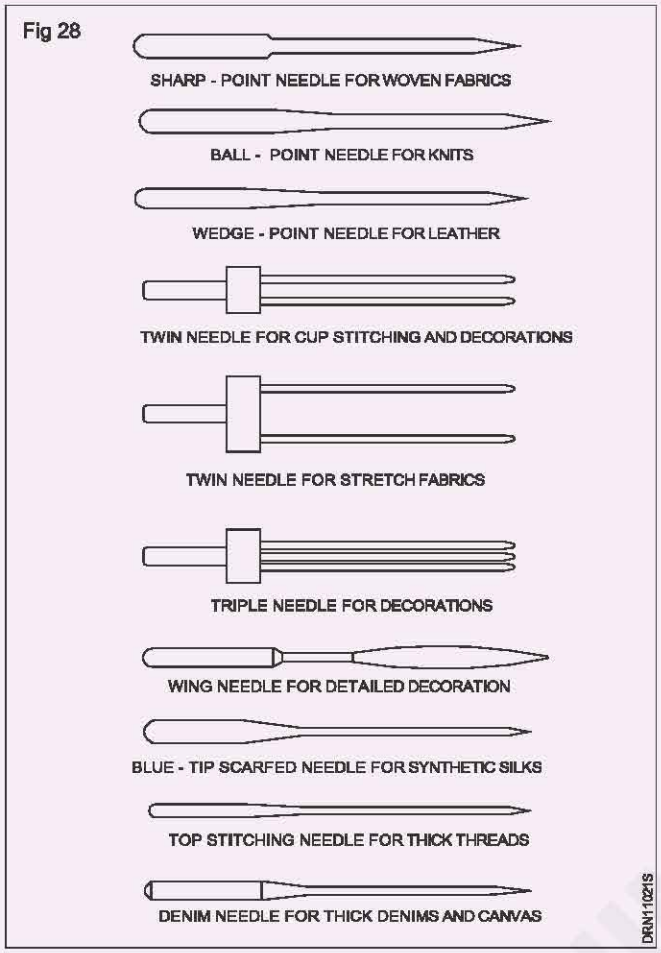
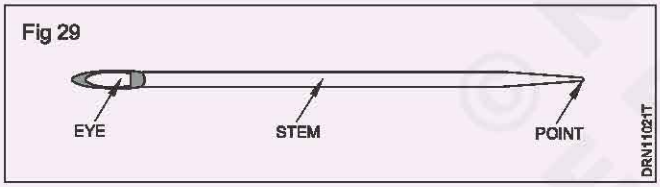
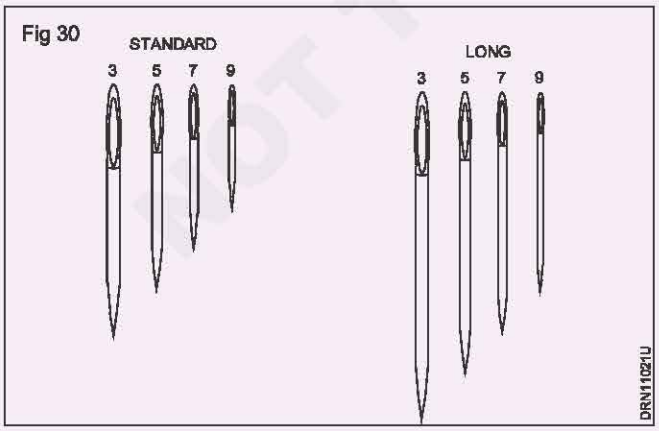


Fig 28
SHARP - POINT NEEDLE FOR WOVEN FABRICS
BALL - POINT NEEDLE FOR KNITS
WEDGE - POINT NEEDLE FOR LEATHER
TWIN NEEDLE FOR CUP STITCHING AND DECORATIONS
TWIN NEEDLE FOR STRETCH FABRICS
TRIPLE NEEDLE FOR DECORATIONS
WING NEEDLE FOR DETAILED DECORATION
BLUE - TIP SCARFED NEEDLE FOR SYNTHETIC SILKS
TOP STITCHING NEEDLE FOR THICK THREADS
DENIM NEEDLE FOR THICK DENIMS AND CANVAS
DRN11021S




The length and thickness of a needle will be choosen according to the fabric to be sewn, the thread to be used and the sewing technique. Sewing needles are made of nickel-plated steel. They have to be flexible, smooth and sharp. (Fig 30)




The needle has to be able to penetrate the material being sewn, without damaging it, by pushing the yarns aside. Solid materials, such as leather or plastic, will be holed. Sewing machine needles of various types are available. according to the application.

Selection of the needle type will depend on the characteristics of the material, the size of the sewing thread, the type of seam and the stitch type.

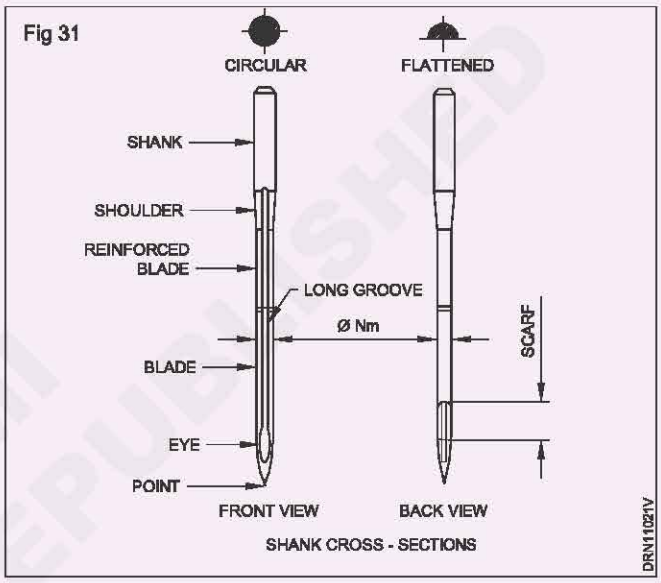
Characteristics and Terminology

The **shank** locates the needle in the needle bar. The follow-ing types are found:

Shanks with a circular section

Shanks with a flat side which serves to locate the needle in a specific position In the ncecild bill

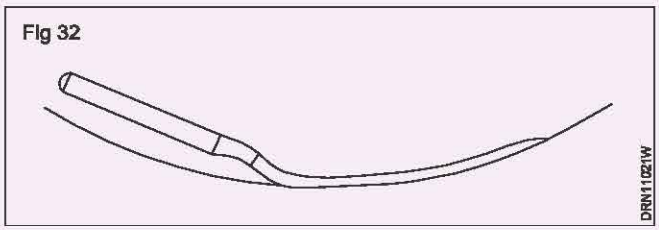
Needles in which the thickness of the shank is maintained all the way down the blade. They are used in speciality machines. (Fig 31)




The **blade** of the needle runs from the end of the shoulder to the beginning of the eye. Often the blade will increase in thickness, in stages, from the eye to the shoulder. This reinforcement of the blade increases its stiffnes.

Moreover, by widening the stitch hole, it tends to reduce the friction between needle and material the upstroke which can help to avoid overheating of the needle.

There are also needles with curved blades (Fig 32) which are used, for example, in blind stitch machines.




On the threading side of the needle is the **long groove.** Its function is to guide the thread while forming the stitch and to protect it against excessive friction.

Above the eye there is usually a recess or **scarf** across the whole face of the needle. This facilitates the passage of the hook into the loop and reduces the danger of missed stitches (Fig 33).

The shape of the **eye** is always extended in Its length, because the needle thread has to pass diagonally through

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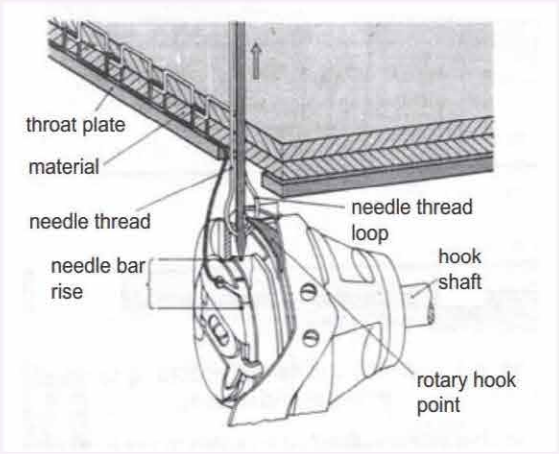
the needle in the length direction. The width of the eye is the same as that of the long groove.

Fig 33




**Needle sizes:** The metric size" Nm" of a needle defines the diameter of the blade (in 1/100 mm) at a point above the scarf.

Fine needles have a size up about 70; medium needles are about Nm 80 or Nm 90; thick needles have a size greater than about Nm 110.

**Forming the needle thread loop:** First, the needle thread is carried all the way through the material to be sewn and beyond the underside. As the needle begins its upstroke, the thread is retarded by friction between it and the material so a loop is formed in the needle thread. The loop is caught by the point of the rotary hook, enlarged, and passed around the under-thread.

The needle thread is then withdrawn whilst the stitch is tightened by the movement of the take-up level. These vertical movements are extremely rapid, so the efficient functioning of the long groove, in permitting smooth passage of the thread, is critically important.

### Needle points

Needles are manufactured with a wide variety of needle points appropriate for the differing properties of rnaterials which have to be sewn The needle point can be located either centrally or eccentrically.

There are two basic classes of points, namely round points and cutting points.

**Round Points:** Round points have 3 circular cross-section but may have two basic shapes known as Set Points and Ball Points, which are suited for different materials.

### Set points

**Slim set points (Fig 34):** Slim set point needles can penetrate the yarns of the material being sewn. They are used for blind stitches and for fine, densely woven fabrics. They are not suitable for knitted fabrics.

**Set cloth point (Fig 35):** The set cloth point is slightly rounded. It displaces the yarns of the material being sewn without damaging them. This is the most versatile point shape.

Fig 34

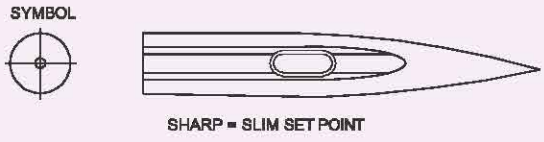
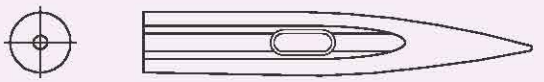
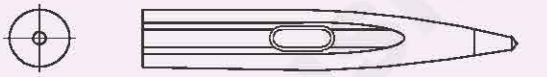



Fig 35




**Heavy set point (Fig 36):** The heavy set point is strongly blunted. It is especially used for button sewing machines.

Fig 36




### Ball points

**Light ball points (Fig 37):** Light ball points are used for sensitive fabrics such as knits, to prevent damage to the loops.

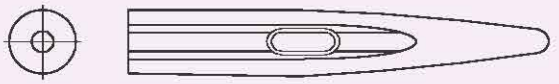
Fig 37

**Medium ball point (Fig 38):** Elastic materials containing rubber or elastorneric threads are sewn with medium or heavy ball points. The threads are not pierced, but displaced.

Fig 38

**Heavy ball point (Fig 39)**

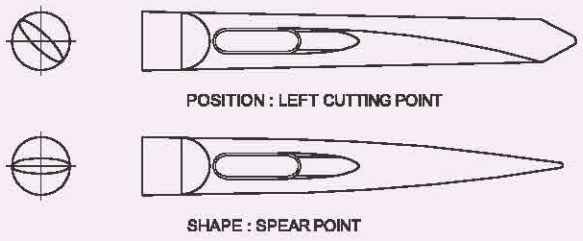
Fig 39




**Cutting points (Fig 40):** Cutting points are used for sewing leather and films or coated and laminated textiles. They are classified and named according to the position of the cutting edge and its shape.

The shapes are named with regard to the form of the cutting edge e.g. spear point, triangular point, diamond point.

Fig 40




## Embroidery and Darning needles

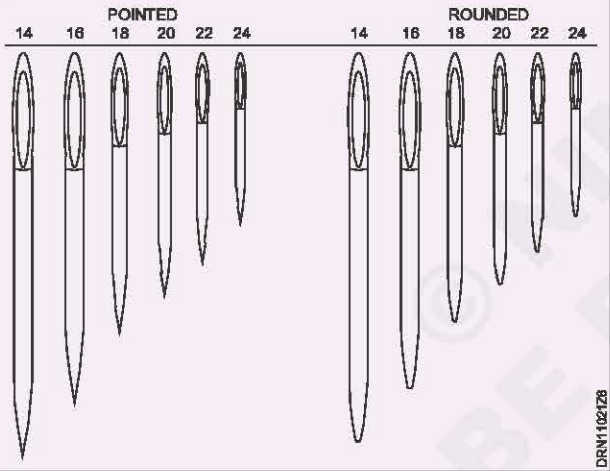
Embroidery and darning needles are particularly thick sewing needles. Material and yarn thickness determine the length and thickness,of the needle to be used .

The numbering system is not directly related to the length or thickness of the needles; it serves only to distinguish one needle from another

Rounded needles are used for coarse materials; pointed needles are used for finer materials.

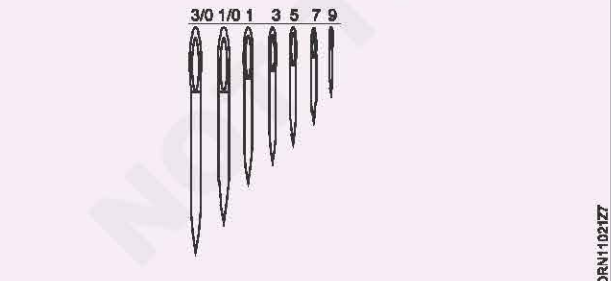
### Embroidery needles (Fig 41)

Fig 41




### Darning needles (Fig 42)

Fig 42




**Pins (Fig 43):** Pins are made of steel or brass and may have plastic heads.

The length, thickness and type of pins are chosen depending on the type of fabric and the application (component assembly, decoration, packaging).

**Darning mushroom (Fig 44):** It is a mushroom shaped tool usually made of wood. The sock is stretched over the curved top of the mushroom and gathered tightly around the stalk to hold it place for darning.

Fig 43

| LENGTH mm | THICKNESS Ømm |
|---|---|
| 30 | 0.60 extra fine |
| 34 | 0.60 extra fine |
| 30 | 0.70 fine |
| 34 | 0.70 fine |
| 40 | 0.85 fine |

| LENGTH mm | THICKNESS Ømm | HEAD COLOR |
|---|---|---|
| 30 | 0.60 | White |
| 30 | 0.60 | Black |
| 30 | 0.60 | Coloured |
| 40 | 0.70 | Coloured |
| 48 | 0.80 | White |
| 48 | 0.80 | Coloured |

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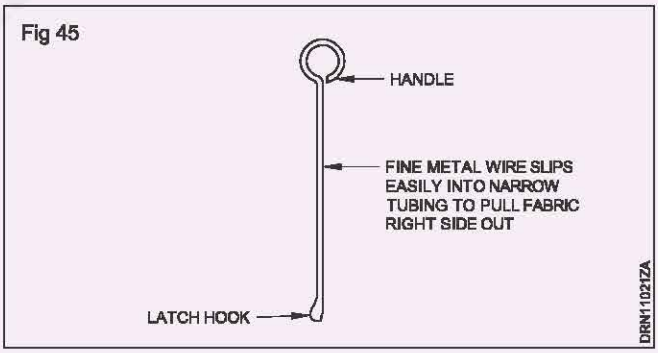
Fig 44

**Loop turner (Fig 45):** It is one of the tools designed for turning the fabric tube right side out after it has been sewn. It is made of metal average about 12'' (30.5cm) long.

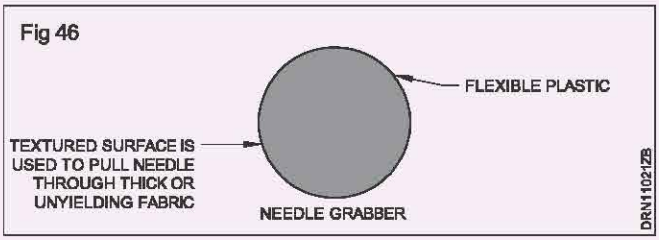
Fig 45




At one end they have a large circle through which hooks the fingers to pull them along and at the other side, is a latch hook that can be placed in the open or closed position.

**Needle grabber:** It is a 2 count rubber disc that grip and pull the needle through layer of fabric. It is useful when hand sewing heavier fabric. It provides protection for sensitive fingers.(Fig 46)

Fig 46

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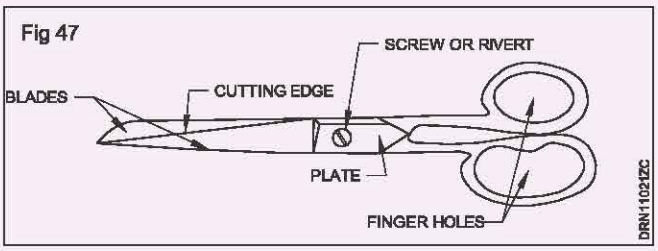
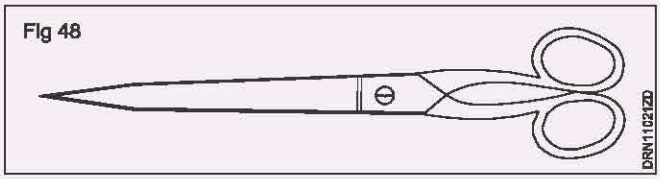
## Scissors (Fig 47)

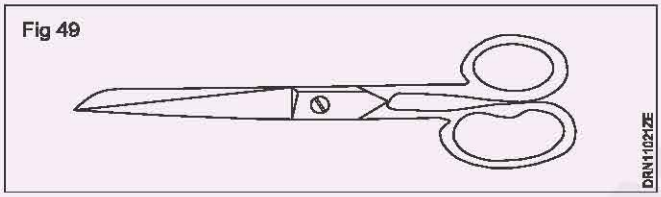



**Paper shears (Fig 48):** Paper shears have long pointed blades. The blades are longer than the handles. They can be used for accurate cutting of thin paper.

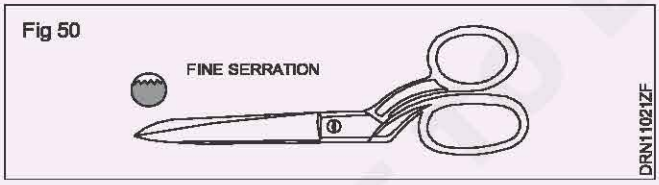



**Hand scissors (Fig 49):** Hand scissors are designed to be easy to handle, with their differently-shaped blades and finger holes.

Hand scissors are used in all general purpose cutting operations.

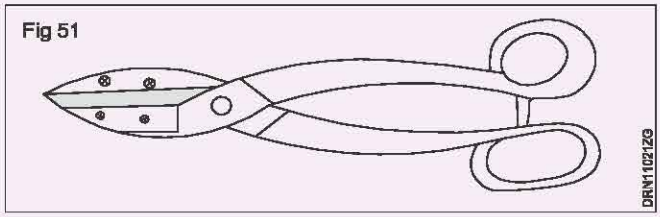



**Tailors shears (Fig 50):** Tailors shears are large and stable. The finger holes are specially contoured, shaped and positioned to make it easier to cut thick fabrics. One of the blades is provided with serrations which helps to prevent smooth fabrics from slipping. Tailors shears are suitable for cutting garment components from single layers.

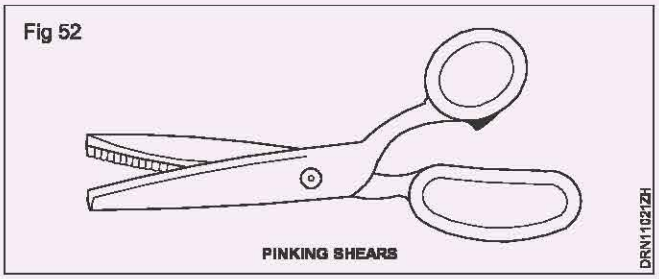



**Pattern shears (Fig 51):** The handles, which are strongly contoured, are much longer than the short, strong blades. In heavy duty types the blades are screwed on and can be changed.

They are used for cutting out pat-tern templates from thick card-board, or plastic.

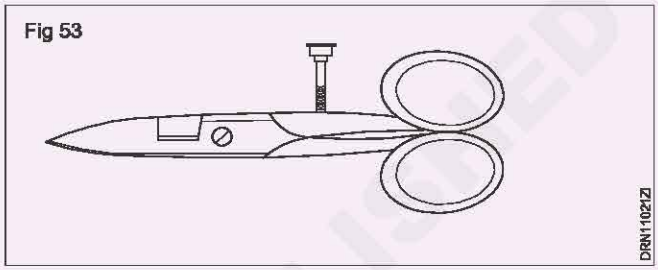



**Pinking shears (Fig 52):** The shape and handling characteristics are somewhat similar to tailors shears, but the cutting edges have a zigzag profile.

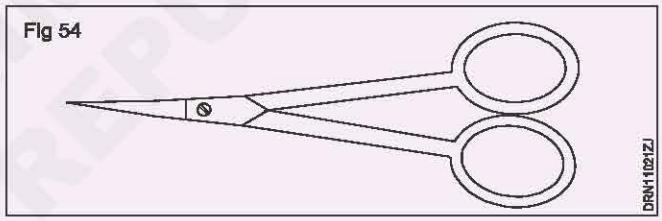



The zigzag edge of the cut fabric reduces tile tendency for the cut edge to fray and may provide a more attractive trimming.

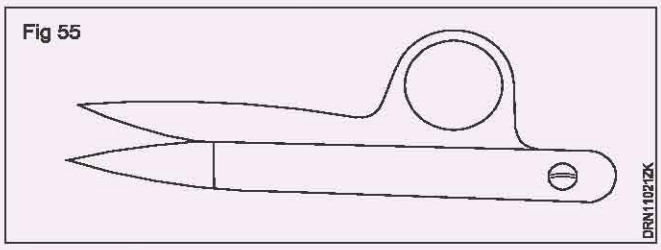
**Buttonhole scissors (Fig 53):** A special gap in the blades allows short cuts to be made Inside the edge of the fabric. The length of cut can be adjusted by a screw




**Embroidery scissors (Fig 54):** The handles are longer than narrow and pointed blades. They are suited for catching and cutting fine,short threads.

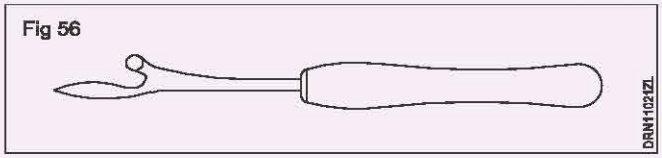



**Snippers (Fig 55):** The small lightly spring loaded blades open automatically. Allows very rapid and easy snipping and trimming of waste thread, or removal of tacking stitches and opening of seams. Used e.g in fitting, final inspection, and reworking.




### Other tools

**Stitch cutter (Fig 56):** The stitch cutter has a hooked edge with an arrowhead. It is especially suitable for opening up machine made button holes.




**Awl (Fig 57):** An awl is made of bone, plastic or metal. It tapers to a point and has 2 smooth surface.

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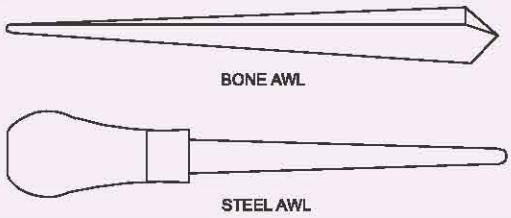
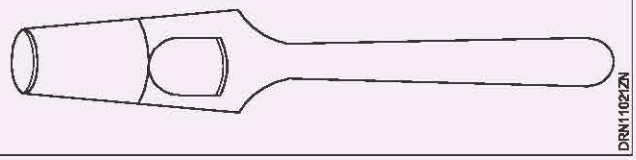
Fig 57




It is used for rounding off button eyes or draw string holes and for pulling out threads.

**Hole punch (Fig 58):** Punches are available in diameters of 2 mm to 25mm.

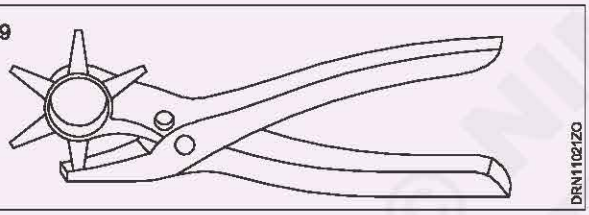
Fig 58




The punch is generally used for making holes in cards or plastic pattern templates or cutting patterns.

**Revolving hole punch (Fig 59):** The revolving punch has a magagine of punches of different diameters.It is used to make holes close to the edge of the fabric.

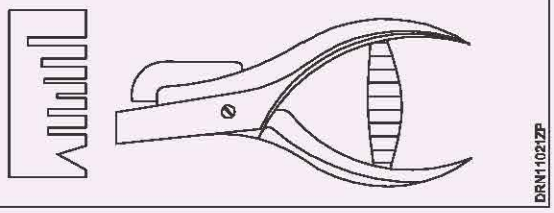
Fig 59




**Notches (Fig 60):** Makes notches of various shapes according to requirements.

Used for placing positioning marks on cutting patterns, e.g. balance marks and seam allowances.

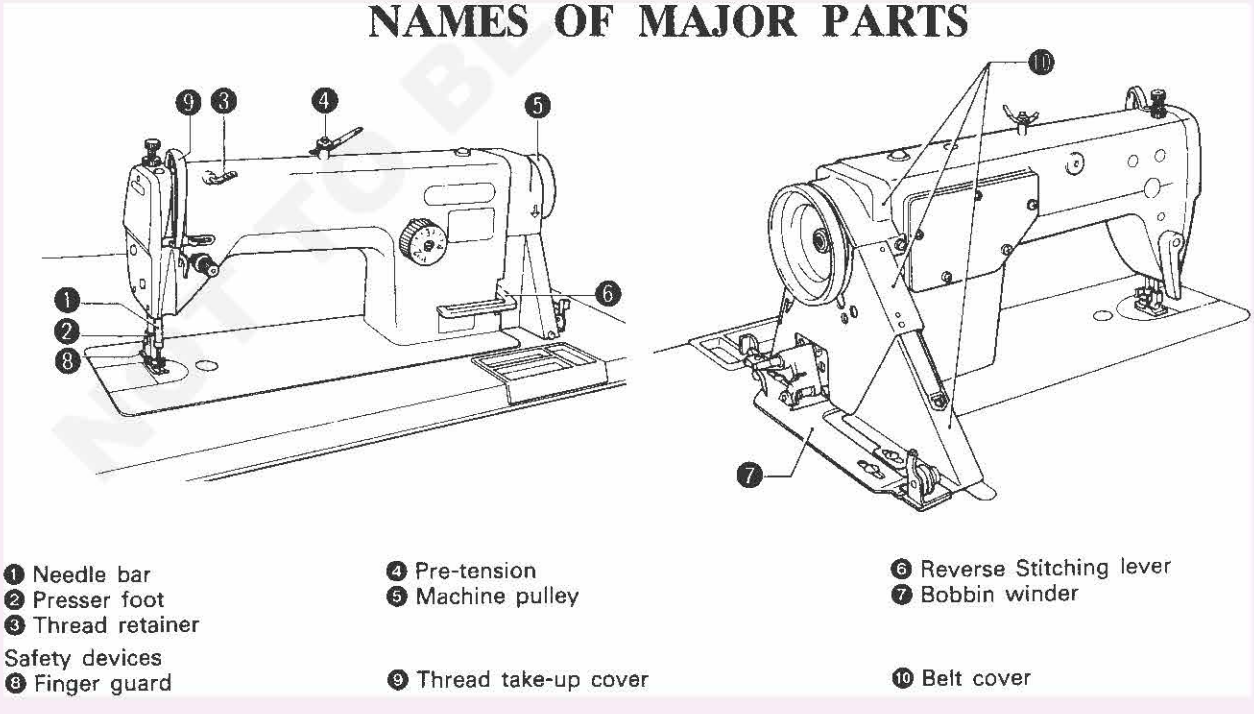
Fig 60




**Sewing machine (Fig 61):** Sewing machine are available in a variety of different styles and configurations and most are operated using foot pedal. Most sewing machines are capable of creating a variety of different stitches including speciality stitches such as button holes.

Sewing machines draw thread from two sources to create a strong stitch in fabrics and also accommodate heavy duty fabrics with the right choice of needles. Sewing machine needles are available in different lengths and thickness to accommodate different applications.

Fig 61

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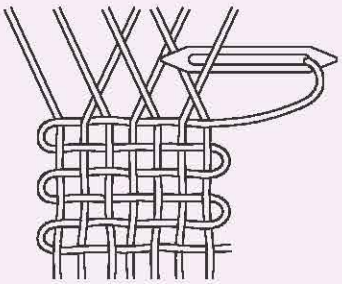
## Fabric construction

**Objectives:** At the end of this lesson you shall be able to
- **explain fabric construction.**

**Construction of fabric:** Woven fabric is constructed by two groups of yarns known as lengthwise and widthwise yarns.

Weaving is inter-leaving of 2 sets of yarns, warp and weft, at right angles. The **warp yarn** is tied to the loom in length direction. The **weft or filling yarns** are inserted at right angles to the warp. (Fig 1)

Fig 1



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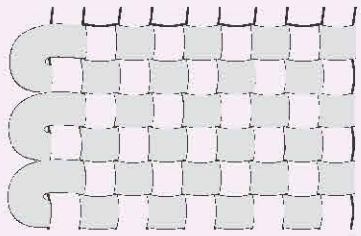
The simplest type of fabric construction is the **plain weave** in which each weft yarn goes alternately over and under each warp yarn. On the sides of the woven fabric, the **selvedge** runs lengthwise as a ribbon like or fringed edge. (Fig 2)

Fig 2



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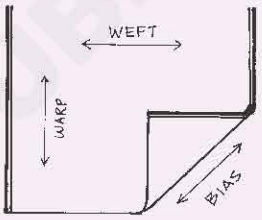
**Grain of fabric** gives the direction of yarns. The warp running parallel to the selvedge forms lengthwise grain. Crosswise (widthwise) grains are formed by weft yarns running perpendicular to the selvedge. The direction oblique to selvedge is called bias. True bias is at 45 degree. (Fig 3).

Fig 3

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## Sources and features of fibres

**Objectives:** At the end of this lesson you shall be able to
- **name the source of different fibres**
- **list the features of fibres.**

For a successful sewing knowledge of fabrics is important. Fabrics are available in a variety of weaves, textures, colours and designs. It is essential to know whether the fabric is suitable for use, whether it is worth your expenditure of time and money. Here are some fabric facts that will help you to select the fabric best suited for your requirements.

Fabrics are made up of **fibres**, either natural or man made. These fibres are spun into yarns and woven together on various types of looms.

Each fibre has its own characteristics which can be changed partly by spinning, weaving and finishing, but even then, the original characterstics are still evident.

The fibre, its main characteristics, and the care of these fabrics can be seen in the table given at the end of the lesson.

Man made fibres are mainly synthetic fibres not found in nature, but gained from a chemical solution. Natural fibres are cotton, linen, silk and wool; except the silk yarn the natural fibres are of short length, called **staples**. These staples are twisted (spun) to a long **yarn**. (Fig 1)

Fig 1

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Longer staples make high quality yarn, more expensive but also more durable. Fabrics made from these high quality yarns are called "combed" in case of cotton material and "worsted" in case of wool. The number of twists affects appearance and durability. A yarn with many twists is stronger and will produce smooth-surfaced fabrics.

A filament yarn is a strand of several meter length either extruded from a chemical solution of which man made fibres derive or it is unreeled from a silk worms cocoon. Filament yarns are smooth, fine and slippery. (Fig 2)

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Fig 2



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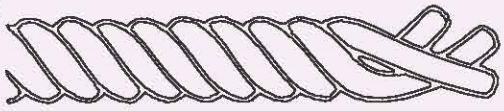
Fig 3



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Yarns can be used alone or two or more yarns may be twisted before weave (ply yarn). (Fig 3)

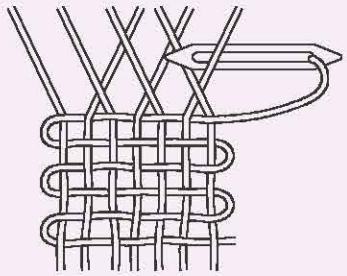
## Basic types of weave

**Objectives:** At the end of this lesson you shall be able to

- **explain and sketch the features of the basic types of weave.**

The rectangular interlacing of yarns is called **weaving**. **Warp yarns** are tied to the loom and filled by crosswise or **weft yarns**. (Fig 1)

Fig 1



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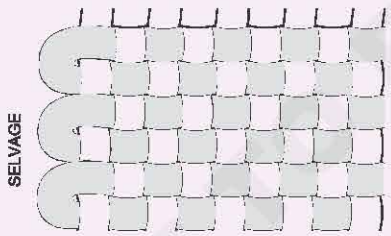
The final weave structure will depend on the way in which the warp and weft yarns are interlaced. There are three basic types of weaves. Most of the other types are variations.

**Plain weave** is the simplest and most common type of weaves. The horizontal threads (weft or fillers) pass alternately over and under successive vertical threads (warp yarns). Muslin or Taffeta are examples for this type of weave. (Fig 2)

Fig 2

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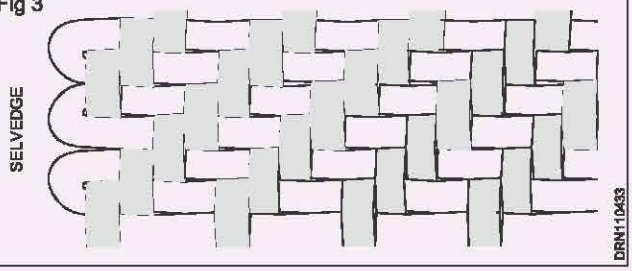
**Twill weave** is woven more closely than the plain weave. The warp and weft threads are interlaced to form a ridge or rube on the face of the fabric. On each successive line the weft moves one step to right or left. Examples are Denim and Gabardine (Fig 3)

Fig 3

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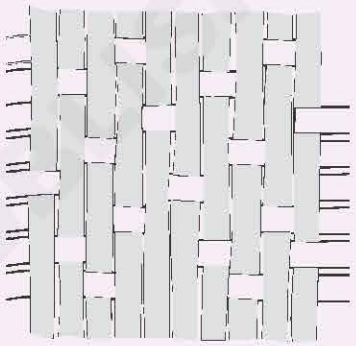
In **satin weave**, one set of threads is floating over the other set of threads. The warp yarn passes over four or eight weft yarns to produce the effect. But it is also possible to create a weft satin weave.

Then the weft yarns are predominant on the face of the fabric. Examples (for the more common warp satin weave) are satin, damast, chiffon (Fig 4)

Fig 4



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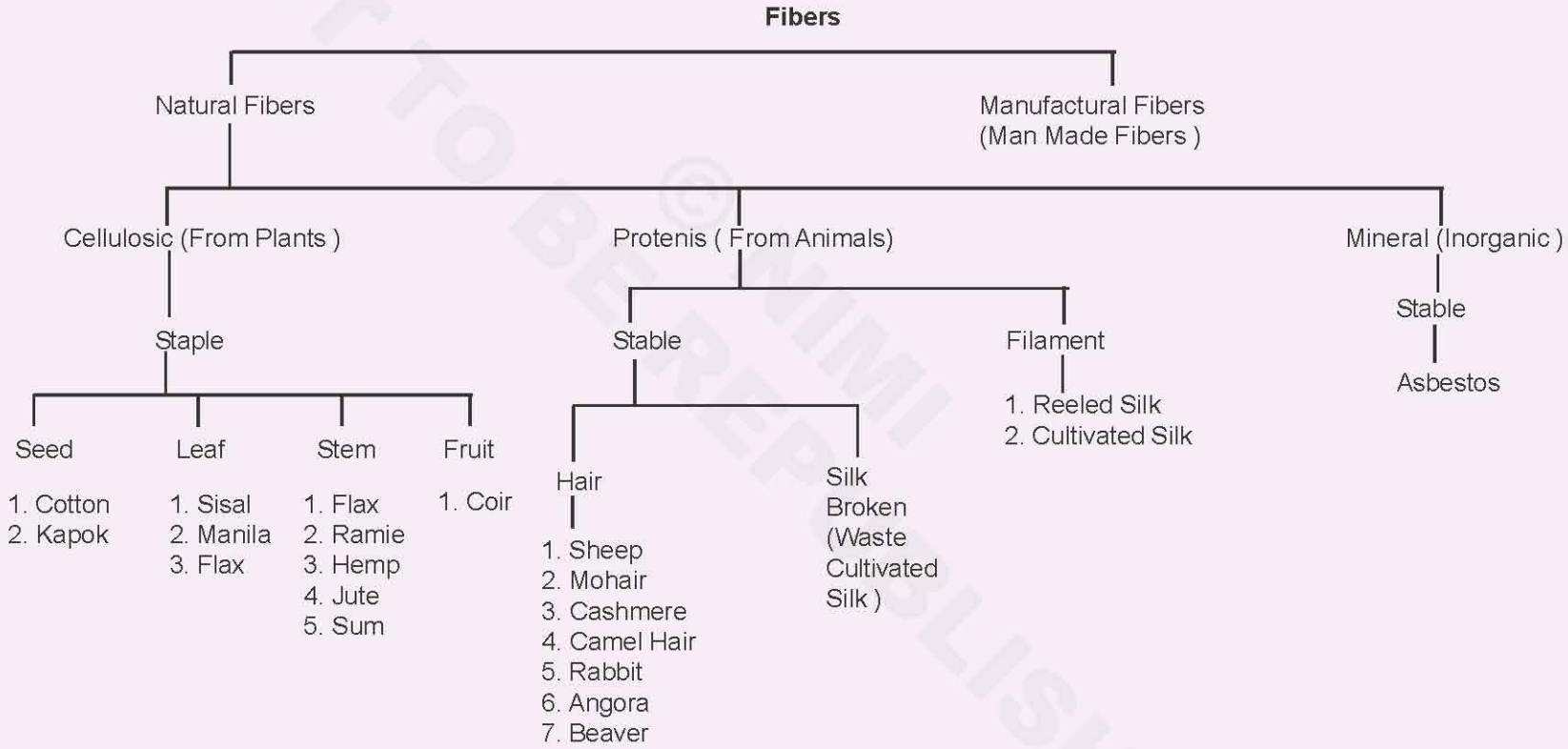
**Non-woven fabrics** have no grain. They are made by pressing fibres together, eg. felt, plastic film and vilene interfacing.

Many fabrics are given a finish after they are woven to increase their body, to prevent shrinkage (sanforized) or wrinkling (crease-resistant), to impart crispness to the surface or to make them drip-dry, water repellent, stain resistant or mothproof. There are also other finishes such as dull, shiny, stretch, rough, soft, smooth, fine, coarse, lustrous, hard and laminated. The fabrics are labelled with the respective finish.

**Napped fabrics** have hairlike fibres lying in one direction. This effect is achieved by a special weaving and finishing process, eg. flannel, velvet, face cloth and wool broad cloth. These fabrics are called one-way fabrics.

Fabrics give variety in feel, e.g. ranging from rough to smooth. This effect is caused by the texture of the fabric. Texture refers to the surface appearance of the fabric and its characteristic body or hang. Texture is created by yarn, weave and finish of the fabric.

**Classification of Fibers**

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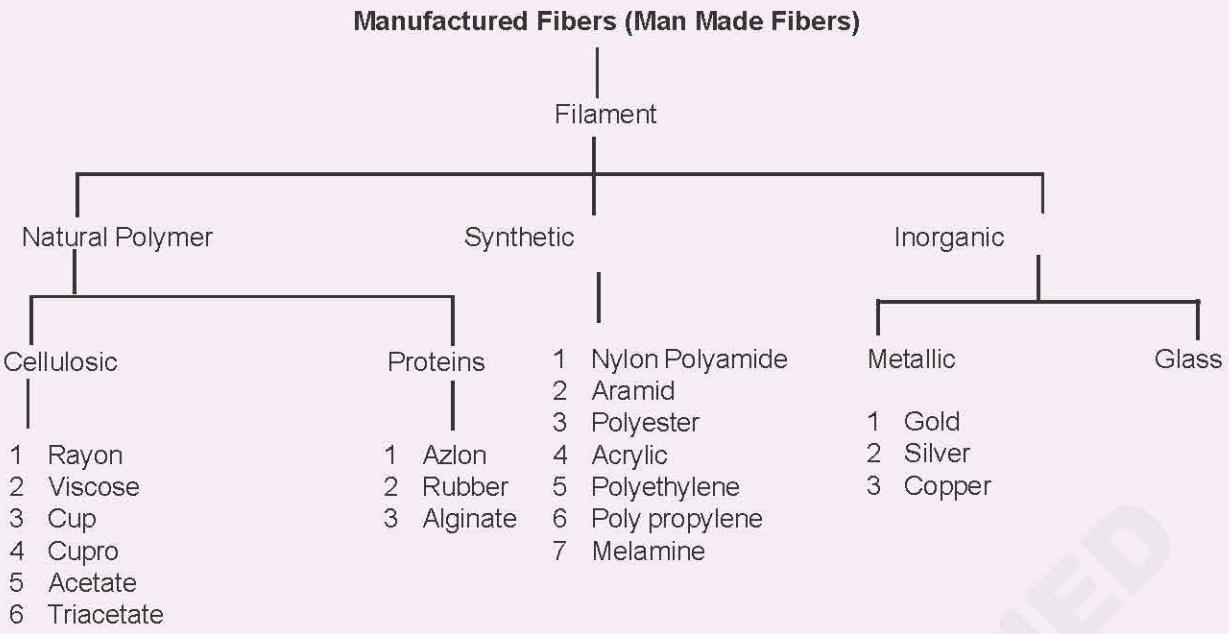


**Identification of fabrics:** For identification of right and wrong side of fabric the following criteria will be helpful. Place both sides of fabric beside each other.

On right side of fabric;

- the design is more bright and clear
- the selvedge is darker
- the piles are visible

If you want to buy a certain fabric like cotton for example you will normally find the information about the type of the fibre written on the selvedge of the material itself.

But some of the fabrics are not labeled. In that case different types of test help to determine the fibre. Two tests which are not difficult to perform are explained below.

**Burning test:** With the help of tweezers some yarns or a small piece of cloth will be burnt horizontally in a flame. The way of burning down, the smell and the residue inform about the type of fibre.

**Dry tearing test:** A piece of fabric is slashed and formed by hand. The length of the fibre ends at the torn edges informs about the type of the fibre. This test helps to distinguish amongst cotton and linen (while the burning test gives same features for these fabrics).

| | Burning | Smell/residue | Dry tear testing |
|---|---|---|---|
| Cotton | Burns quickly and bright | Like burning paper/leaves a grey ash powder | Short fibre appear at the torn edges |
| Linen | Burns quickly and bright | Burns like paper/grey powder ashes left | The torn edges are much longer than that of cotton |
| Wool | Burns slow | Like burning horn or hair/ black ash is left | |
| Silk | Burns slow | Smell like burning horn or hair/leaves a black crystalline ash | |
| Polyester | Melts and shrinks from | No smell/leaves a brownish mass the flame<br>hard and uncrushable | |
| Nylon | Shrinks and melts away from flame | No smell/leaves a hard residue, with fibre uncrushable forming drops | |

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**Characteristic features of fibres**

| Fibre and source | Characteristics | Typical fabrics and uses | Care |
|---|---|---|---|
| **Natural fibres** | | | |
| **Cotton** From seed pod of cotton plant | Strong even when wet absorbent. Draws heat from body. Tends to crease Good affinity for dyes. Shrinks unless treated. Weakened by sunlight. | Used for summer wear, season-spanning garments, work clothes Examples: Corduroy, denim, poplin, terry, organdy, seer-sucker care instructions | Most cottons can be laundered Colourfast ones in hot water, others in cold water. Tumble-dry at hot setting. Chlorine bleach can be used . Iron while damp. |
| **Linen** from flax plant | Strong. Absorbent. Creases unless treated. Poor affinity for dyes. Some tendency to shrink and stretch. Deteriorated by mildew. | Fabrics usually have coarse texture and natural luster Draws heat from body Weave weights vary light to heavy. Used for spring and summer wear; also many household items | Usually dry-cleaned to retain the crisp finish. Can be washed if softness is preferred. Usually shrinks when washed. |
| **Silk** from cocoons of silkworms moths. | Strong. Absorbent. Holds in body heat. Crease resistant. Good affinity for dyes, but may bleed. Resists mildew, Weakened by sunlight and perspiration | Luxurious, lustrous fabrics in many weights. Used for dresses, suits, blouses and linings Examples: Brocade, chiffon, crepe, satin, tweed, jersey | Usually dry-cleaned, if washable, usually done by hand in mild suds. Avoid chlorine bleach. Iron at low temperature setting |
| **Wool** from fleece of sheep | Relatively weak. Exceptionally absorbent. Holds in body heat Creases fall out. Good affinity for dye. Needs mothproofing. Shrinks unless treated | Fabrics of many weights, textures, constructions. Used for sweaters, dresses, suits and coats Examples: Crepe, flannel, fleece, gabardine, melton, tweed, jersey | Usually dry-cleaned. Many sweaters can be washed in tepid water and mild suds; do not wring. Do not use chlorine bleach. Some wools can be machine-washed; follow instructions. |
| **Man-made fibres** (selection) | | | |
| **Nylon** | Strong. Low absorbency. Holds in body heat. Resists wrinkling, soil, mildew and moths. Tends to pill. Accumulates static electricity. | Wide range of fabric textures and weights. Often blended with other fibres. Used for lingerie, linings, swimsuits, blouses & dresses Examples: Fake fur, satin, jersey | Can be washed by hand or machine in warm water. Use gentle machine cycle. Use fabric softener to reduce static electricity. Tumble-dry or drip-dry. Iron at low temperature. |
| **Polyester** | Strong. Low absorbency. Holds in body heat. Resists wrinkling, stretching, shrinking, moths and mildew. Retains heat-set pleats electricity Examples: Crepe, double knit. | Wide variety of fabrics in many weights and constructions. Used for dresses, Accumulates static suits, sports-wear, lingerie, linings, curtains, thread, filling for cushions setting for touch-ups. | Most polyesters are washable in warm water by hand or machine Tumble-dry or drip-dry. Use fabric softener to reduce static electricity. May need little or no ironing; Use moderate heat. |

The textile labelling regulations in different countries aim at providing information on the fibre types which have been used to make a fabric. In dresses, the fibre content information is written on sewn-in labels fixed at collar or in the side seams.

In fabrics, it is wirtten on the selvedge. If the product is sold in a package (e.g. socks) the information is given on the packaging.

| | |
|---|---|
| **100% silk** | Materials which are made 100% from only one raw material may be described as "pure" or "all"; an allowance of 7% for visible decoration material is given. Interlinings used for shaping need not be identified. |
| **80% Nylon<br>20% of elastine** | With blended products, the percentages by weight of the constituent fibres must be given. The fibres must be listed in decreasing order. |
| **Minimum 85% silk** | For textiles which are made from several fibres, one of which is at least 85% it is sufficient to say "85% minimum content". |
| **60% silk with wool and viscose** | If no one fibre in a blend is as much as 85%, then it is sufficient to give the percentage share of the dominant fibre with the other components listed in decreasing order. |
| **85% cotton<br>15% other fibres** | If one or more components are present in an amount of less than 10%, then they may be designated as "other fibres" |
| **Outer fabric: 100% new wool<br>Lining: 100% silk** | With lined clothing, the fibre content of the main lining material must be given. |

**Selection of thread and needle:** A perfect stitch can be obtained only when the thread is selected to suit the material to be stitched and the needle is of correct size. For stitching on thin fabrics use fine thread and fine needle. For heavy fabrics, needle and thread size should be larger.The table will guide for the selection of appropriate needle and thread size. The last column in the table gives the approximate number of machine stitches per 2.5cm.

**Table 1**

| Sl. No. | Weight of the Fabric | Type of Cloth | Thread size | Needle size | Stitches per 2.5 cm |
|---|---|---|---|---|---|
| 1 | Light | Muslin, Cambric and other thin fabrics | 50 | 9 - 11 | 14 - 20 |
| 2 | Medium poplins, etc. | Shirting, Sheeting, | 40 - 50 | 14 | 12 |
| 3 | Medium heavy brocade, corduroy | Light woollens, | 40 | 16 | 10 - 12 |
| 4 | Heavy upholstery fabrics | Woollen goods, | 20 | 18 | 8 - 10 |

**Needle guard policy:** Needle guard policy is also known as needle control system. Needle control system is a part of product safety compliance.

As per the survey reports United States and European countries have strict regulations for children's clothing. These regulations require the retailers, among other things, to ensure that broken parts of needles or any other metal object do not find their way into the garment or its packaging, can cause injury to the customers.

Therefore, factories are required to put in place reliable procedures to prevent needles, pins or other sharp metal objects from entering the final products. Similar precautions are also required for under garments.

Factories need to ensure that each and every needle in the factory is accounted for. There should be no needles in the factory anywhere except the ones attached to machine and those in the stock. Broken needles parts should be collected and kept safely for record.

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Garment manufacturers should adopt a policy and a set of operating procedures to prevent and detect a metal contamination in the garment. A factory can take the following measures to establish an effective needle control system.

The needle control can be done by the following steps

1 The factory should keep the entire stock of new needles under lock and key and away from sewing area.

2 They can maintain the broken needles record.

3 All the parts of broken needles should be collected immediately and disposed properly.

4 The factory should not allow the operators to keep spares needles.

## Method of shrinking

**Objectives:** At the end of this lesson you shall be able to
- **explain the method of shrinking and it's use.**

Fabrics have a tendency to shrink when they are first dipped in water. Therefore, the fabric is made to shrink before stitching. Pre-shrunk material does not need shrinking treatment.

Shrinkage is not necessary in case of sanforized fabrics. Non-sanforized fabrics like cotton, silk, wool etc. have to be shrunk by different methods.

After shrinking the fabric should be pressed well to remove wrinkles.

There are several methods of shrinking. The fabric may be soaked in water for a few hours or the fabric may be steamed.

**Shrinking treatment for different fabrics:** White fabrics (Cotton, Linen) should be soaked in hot water for minimum of four hours. The position of the fabric should be changed once or twice to get uniformity in the shrinkage. Same treatment is applicable to coloured fabrics as well, except that these are to be soaked in luke warm water.

The shrinkage treatment for woollen fabric is given by steam, adopting any one of the two methods:

A wet turkish towel is placed in between two layers of the woollen fabric so that the right sides touch the wet towel. Spread press cloth on the top layer and press it with hot iron. The steam generated from the wet towel ensures shrinkage.

The other method is to spread a wet muslin cloth over the fabric and rolling the fabric together. Then the wet muslin is removed and the fabric is pressed with hot iron.

**Precautions**

– The container used for soaking and the wire ment for drying should be free from rust and dust

– Two different coloured fabrics should not be soaked together

– Drying should be done under the shade.

## Straightening the fabric ends

**Objectives:** At the end of this lesson you shall be able to
- **straightening fabric ends.**

Woven fabrics, especially of lower quality, are often slightly off-grain, meaning their lengthwise and crosswise grains are not completely perpendicular.

To make sure that the lengthwise and crosswise threads are at right angles,and that the fabric is "on-grain" it's necessary to striagthen one of the cut ends. If there is a prominent design line, such as a woven stripe plaid, cut along the design. Do not use a printed line as a reference; the print may not match up with the grain. If there is not a design line to follow, you need to pull a crosswise thread.

Snip thorugh the selvage, find one crosswise thread and pull it, like a gathering thread, until you reach the opposite selvage. If the fabric is loosely woven, you might be able to pull the thread completely out of the fabric. If it is tightly woven, you will need to pull the threads every few inches or pull it slightly so it puckers (1); then slide the thread and push the fabric repeatedly until you reach the opposite selvage. cut the fabric along the pulled thread.

Once you have a perfectly straight cut edge, fold the fabric in half lengthwise (aligning the selvages). If the cut edge is not straight, or the corners don't form right angles (2), the fabric is off-grain and needs to be corrected.

Correcting distorted grain

If a woven fabric is only slightly off-grain, pin together the selvages and one cut edge, placing pins every few inches. Steam press the fabric starting at the selvages and pushing the fabric toward the fold with the iron. If the fabric is truly off-grain, pull the fabric on the bias, in the directionit needs to be straightened (3). Pull firmly until the edges are even and all corners form right angles.Repear for the length of the fabric. Refold the fabric to check that the ends are even. Take care not to pull too strenuously, or the fabric will stretch out of the shape.

If a fabric is off-grain when the print is applied, once you straighten the fabric grain, the print will be off kilter. Carefully inspect print fabric before purchasing , and avoid any fabrics with a print that is badly off-grain.

Fabrics with special finishes can't be pulled on grain wither;examine them carefully before purchasing.

**Measuring techniques**

**How to take body measuremet?:** When taking measurement it is most accurate with under-garments or garments worn should be plain and well fitting.

Pull the tape firmly around the body part but not too tight; keep it parallel to the floor. Measure always around the fullest part of each body area.

**Measurement charts:** Every person has an individual height and shape of the body. Big, small, fat persons don't match with the ideal proportions. While stitching a garment the shape of the garment has to be adjusted to the shape of the body as much as possible.

The most accurate way of shaping a garment according to the individual body takes place on the basis of measuring an individual body. This measurement will reflect all individual conditions. Since the garment industry does not produce for an individual customer they produce dresses for body measurements which represent a larger number of persons. These measurements are found by measuring thousands and thousands of people of a certain region/country. The data found in such a survey will be systematically organised in a chart valid for that particular area.

Even though many charts can be seen in books, a proper measurement chart for the Indian population is still missing. Therefore the Trade Practical book is not referring to a chart. The measurements given with every garment are based on experience, but it is always the best to take authentic measurement from the person to stitch the dress for.

| Sl. No. | Body measurement | Abbreviation | How to take body measurement |
|---|---|---|---|
| 1 | Natural Waist | NW | Measure on back from nape to waist |
| 2 | Full Length | FL | Measure from neck point to waistline upto the desired length of garment |
| 3 | Shoulder | Sh | Measure from left shoulder end to the right shoulder end (where you find the ball moving while moving your arm) |
| 4 | Sleeve length | SL | Measure from shoulder end to desired sleeve length (for full length arm should be in a bended position) |
| 5 | Sleeve bottom or round arm | SB | This is a garment measurement. It gives the desired girth of sleeve at bottom line |
| 6 | Chest | Ch | Measure around the fullest part of chest/bust above the nipple line (one finger loose) |
| 7 | Bust (Ladies'garment) | B | |
| 8 | Waist | W | Measure a round the natural waist line, draw the tape close but not too tight |
| 9 | Hip | H | Measure firmly around the fullest part of hip |
| 10 | Neck | N | Measure loosely around the base of neck |
| 11 | Across chest | ACh | Measure across the chest line on scye level |
| 12 | Across back | AB | Measure on back from one sleeve joint to the other on scye level (Above the blade bone) |
| 13 | Bust level | BL | Measure from neck point (which is on the level of neckline at side) to bust |
| 14 | Leg Length (Side length) | LL | Measure outer leg length from waist to ankle (or desired length of garment) |
| 15 | Inner leg length | ILL | Measure from fork to ankle or leg length - body rise |

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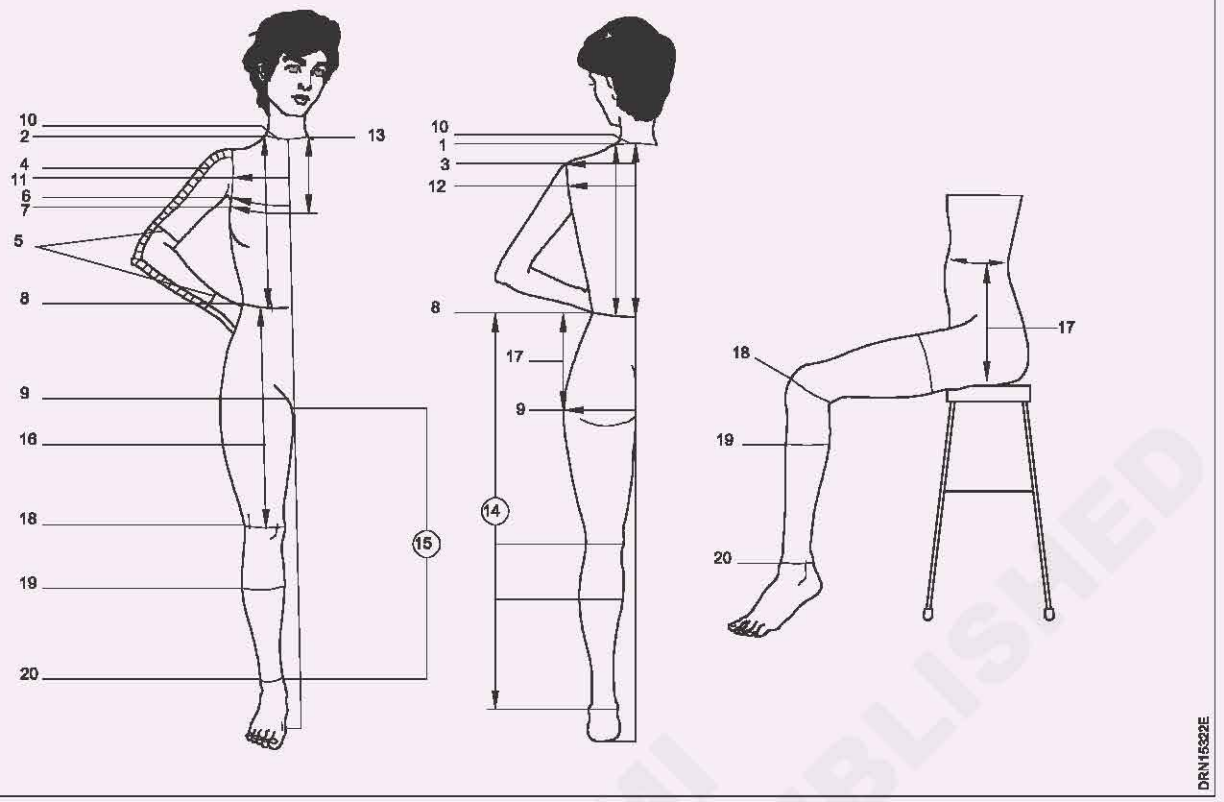
Fig 14




**Five common problems faced by garments industry**

All manufacturing industries deal with various challenges and issues in their product manufacturing processess. The garment industry is not an exception. Like other industries,it has to face everyday challenges while making garments to meet consumers demands. It is good to know the problems beforehand so that you can make infromed decisions for the improvement of the production process. In this article today, we will be discussing about fivr common problems that all garment manufacturers face that hampering their production performance and delaying delveries.

**Raw-material issue**

Raw material are essential to the garment industry. Garment manufacturers depends on a great numbers of suppliers for raw materials across the world. Due to various reasons such as incorrect knowledge of available stock, inaccurate knowledge of exact requirement during production phase, natural disasters, geopolitical instability, manufacturers don't get raw materials on time. If they get either the quality of the materials is worse or the number is insufficient. As a result, they face issues with material sourcing and shortages.

**Inventory management issue**

It is important to get full control and visibility of the inventory to track the stockand the quantity of the order and to understand when the stock needs to be refilled to run the bussiness operations properly. But many garment manufacturers still follow the outdated inventory management method is using plaim excel files. They make the list of their items with a pen and paper method, use manual processes, track the inventory by entering the information in a spreadsheet. Due this, they are unable to scale up their inventory management process. There are various digital methods to solve this problem.

**Production Delays**

Production delays are common in the garment industry. Human errors, imefficiency in the supply chain, slow production , following outdated manufacturing processes, lack of transparency are some of the reasons that the garment industry is still dealing with unnecessary production delays.

**Order processing issue**

The garment order passes throughj a lengthy and unique process in many ways. From preparation to finishing the products to meet quality approvals, There are various challenges that garment manufacturers face in order processing. Half baked products lying in the warehouse to be sent to the next jobber or improper followups with jobbers for receiving goods delay things in general.

**Garments Defects**

Garment defect is another big issue for garment manufacturers. After finishing the product, a number of defects are found on garments like loose buttons, holes stains discoloration, inappropriate trimming, poor ironing, loose thread, etc. All these happen due to poor communication, improper cutting, triming, improper handling of the parts of the garments, developing marketing research planning and collect needed information.

**The makeup of fashion market research**

Fashion market research is made up of two sources of information, referred to as primary and secondary research. By using both primary and secondary sources of information, you can determine several key factors about your target market and its various segments. These include;

1 Annual spend on fashion in your niche

2 A comparison of shopping experience frequencies, in-store vs. online

3 Wardrobe share of certain brands and/or apparel categories

4 Where and how your target market discovers your brand

5 Shopping triggers

6 Spending forecasts

7 Marketing channels

8 Product diversity

9 How in-demand your products or brand are

To reap the most insights, you should plan to incorporate both primary and secondary sources to drive your fashion market research towards success.

**Primary Research for the Fashion Industry**

Primary market research refers to the unique data that is gathered from first-hand sources. While it is more labor-intensive to gather primary information, you are rewarded with data that is particularly relevant to your particular business and customer base. It also puts you in control in terms of the data you collect and then leverage.

The most valuable sources of primary information for fashion market research are:

Online survey tools about existing or prospective customers, i.e., those in your target market that have not yet bought from you.

Phone, in-person, and mall intercept interviews

Focus groups:

In contrast to one-on-one interviews, a focus group allows for moderated discussion among participants. This provides the opportunity for the group to share ideas and discuss a topic or trend, which is particularly useful when conducting fashion market

**Field research:**

This gives marketers an opportunity to observe and understand how customers behave in a natural setting. When it comes to fashion market research, field research provides valuable information about how customers browse and shop, both in-store (through natural observation) and online (via session replay tools).

**User testing:**

Often used to test out new design concepts, user testing gauges customer interest and reception. It is also used to test out in-store shopping experiences and changes to fashion websites.

Consumer research panels

**Secondary Research for the Fashion Industry**

Secondary research is performed by sourcing data from existing, published sources, i.e., data that you don't need to amass yourself, as it has already been conducted. You should then parse through and organize the secondary data to prepare it for analysis. A strong analysis involves comparing the secondary resources against each other, along with their primary source counterparts.

Good sources of secondary information for the fashion industry include:

1 Market and industry research reports and white papers

2 Fashion industry websites

3 SEO, keyword, and trends research

4 Governments statistics

5 Your competitors' websites and other digital properties such as apps, mobile sites, ads, etc.

**Implementing marketing research plan**

**Five success tips for market research surveys**

1 Define your marketing challenge. The first step to designing a good market research paln is to define your need.

2 Craft your survey questions carefully

3 Distribute your research survey to the right auidence

4 Review your new market research data

5 Make data-driven marketing decisions.

# Sewing machine - types - parts - maintenance

**Objectives:** At the end of this lesson you shall be able to
- **identify the parts of the machine and name their function**
- **explain the required maintenance work for the proper functioning of the machine.**

**Types of sewing machines:** Sewing machines are various models such as domestic model, tailor model, industrial model, portable model and cabinet model are available in the market. When you buy a sewing machine, select one that is made by a well-known manufacturer.

They may be operated by hand, treadle or electric motor. Good work can be done in a hand machine but it is slower than a treadle, which leaves also both hands free to manipulate the fabric. An electric sewing machine is ideal, being less strenuous and quicker to use because the hands are free to manipulate the fabric.

If you are interested in fancy sewing, you may select the new models with decorative stitching attachments. A beginner will find the foot or treadle machine easier to handle, since it is easier to control the speed.

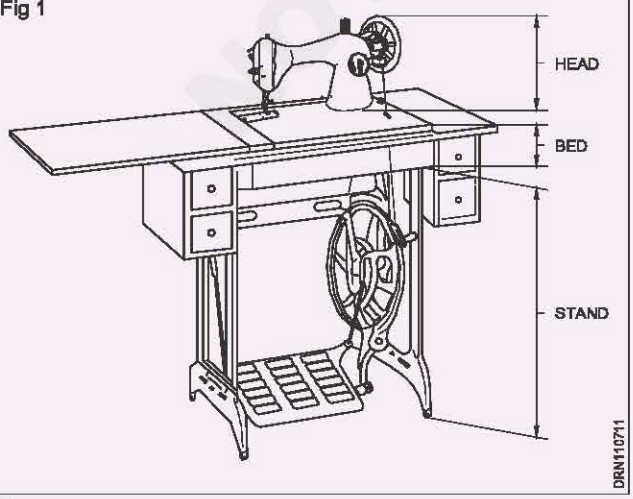
The invention of the sewing machine was a great progress in Sewing Technology since sewing became faster, seams were more durable, stitches were more even. Main feature of sewing with machine is the use of top and lower thread which are inter-linked in stitching progress.

If you have a hand machine, you need practice to turn the wheel smoothly with your right hand and guide the fabric with the left hand.

An electric sewing machine is operated by knee or foot control of an electric motor. A little practice is required to control the pressure needed to operate the machine at any desired speed with an even regular rhythm.

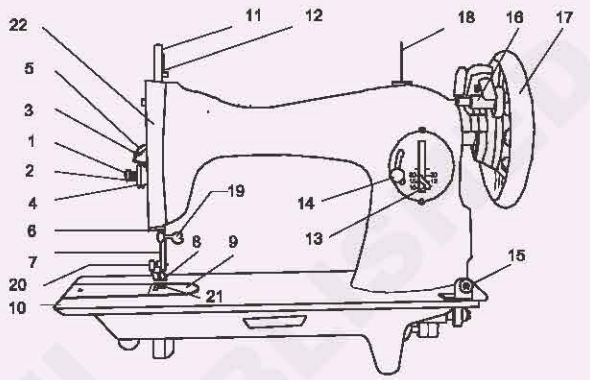
**The treadle sewing machine and its parts:** Most of the parts are common in all sewing machines. Each machine has a so called machine head and machine bed, while the stand and its part is a typical feature of the treadle sewing machine (Fig 1).

Fig 1




The parts of the head are as follows. (Fig 2)

Fig 2




| | |
|---|---|
| 1. TENSION NUT | 12. PRESSURE BAR |
| 2. TENSION DISC | 13. STITCH REGULATOR LEVER |
| 3. EYELET | 14.STITCH REGULATOR LOCK SCREW |
| 4. THREAD TAKE-UP SPRING | 15.BOBBIN WINDER THREAD GUIDE |
| 5. THREAD TAKE-UP LEVER | 16.BOBBIN WINDER |
| 6. THREAD GUIDE | 17.BALANCE WHEEL |
| 7. NEEDLE | 18.SPOOL PIN |
| 8. PRESSER FOOT | 19.NEEDLE CLAMP |
| 9. NEEDLE PLATE | 20.PRESSER FOOT SCREW |
| 10. SLIDE PLATE | 21.FEED DOG |
| 11. NEEDLE BAR | 22.FACE PLATE |

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**Spool pin (No 18)** holds the spool of thread.

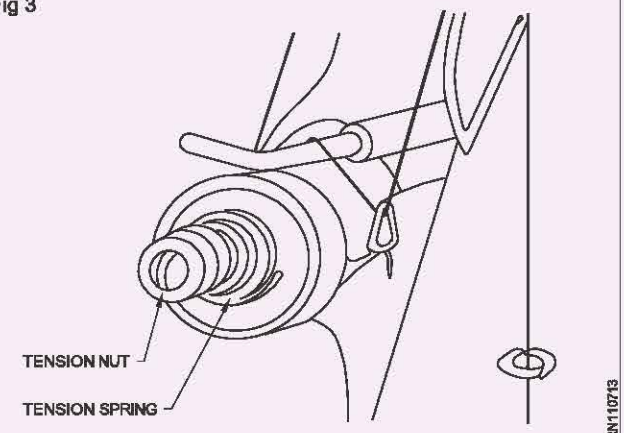
**Thread guide (No 6)** holds the thread in position from the spool to the needle.

**Tension disc** is a simple mechanism, where two concave discs are put together with the converse sides facing each other. The thread passes between the two. The tension of the thread is adjusted by a spring and a nut, which increases or decreases the pressure on the disc, ie. the thread. (Fig 3)

**Take up lever** is fitted to the body of the arm which receives its up and down motion from the front. At the outside end of the lever, there is a small hole through which the thread passes. There are two functions of this lever:

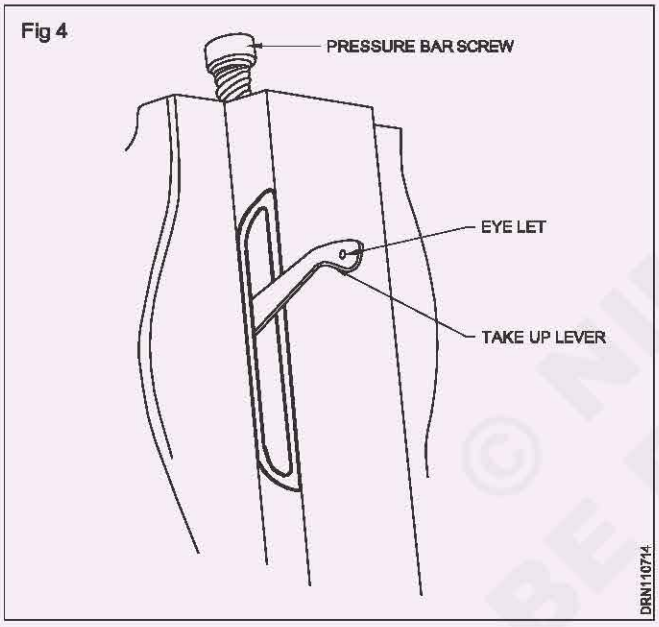
– to feed the thread to the needle
– to tighten the loop formed by the shuttle (Fig 4)

Fig 3




**Face plate** is a removable side cover which gives access to the oiling points on needle bar, pressure bar and thread take-up. (Fig 4)

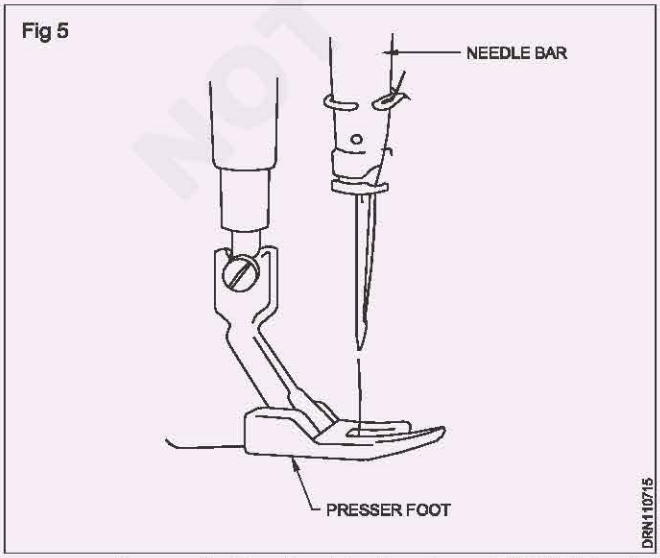
Fig 4




**Needle bar** is a steel rod, which holds the needle at one end with the help of the clamp. (Fig 5)

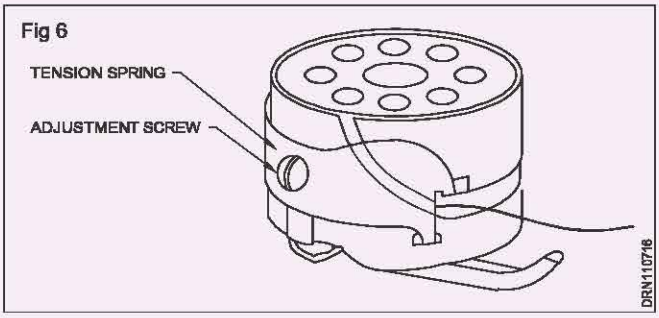
**Presser foot** is attached to the presser bar and it holds the cloth firmly in position, when lowered. (Fig 5)

Fig 5



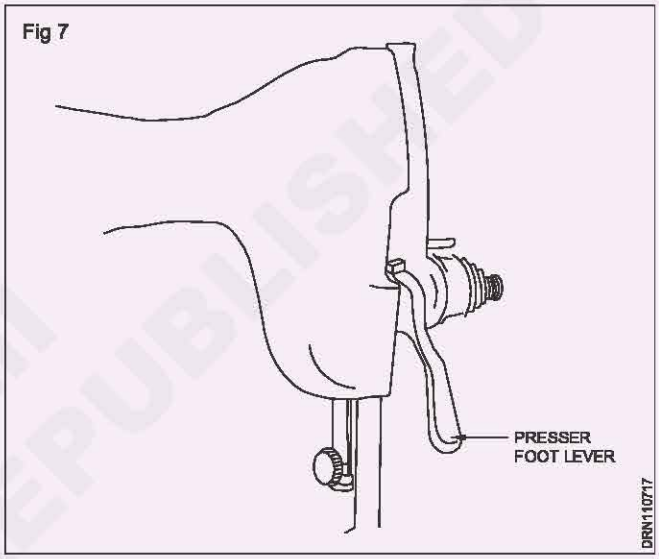

**Bobbin case** moves into position to catch the top thread and forms the stitch, as the needle is lowered into the bobbin chamber. (Fig 6)

Fig 6



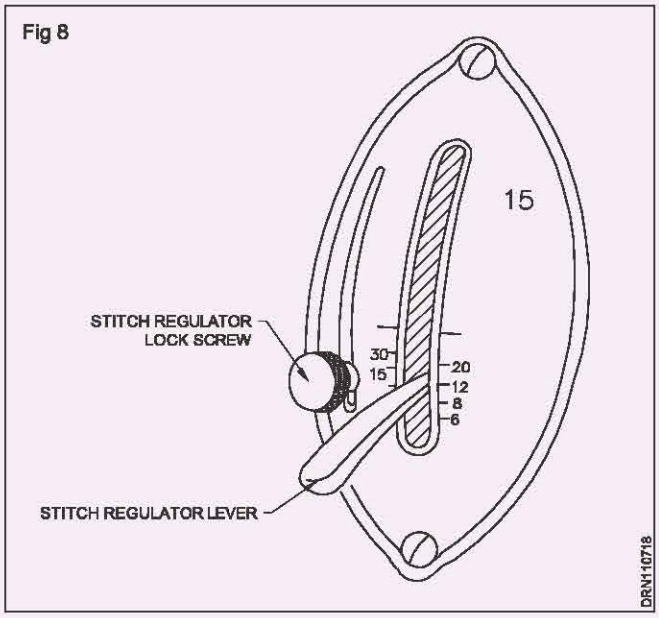

**Presser foot lifter** is a lever attached to the presser bar for raising and lowering the presser foot. (Fig 7)

Fig 7




**Stitch regulator** controls the length of the stitch. Some regulators can be set to stitch in reverse. (Fig 8)

Fig 8




**Bobbin winder** facilitates the winding of thread on the bobbin. Some are made to stop automatically when the bobbin is full. (Fig 9)

When the **flywheel** is made to rotate, it works the mechanism of the machine. (Fig 10)

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**Stop motion screw** is in the centre of the flywheel and it engages and disengages the stitching mechanism. (Fig 10)

Fig 9

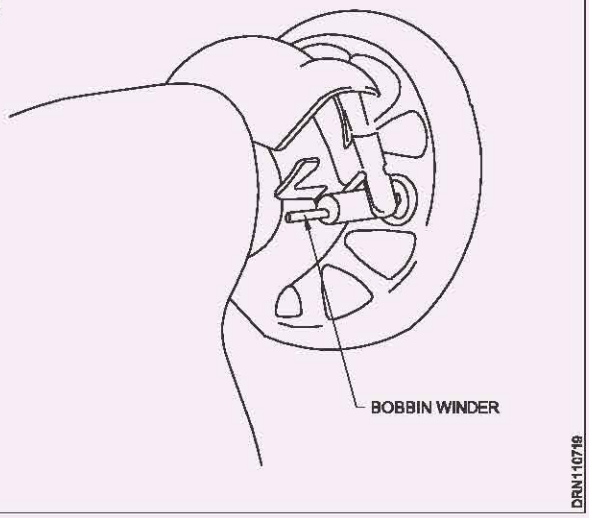
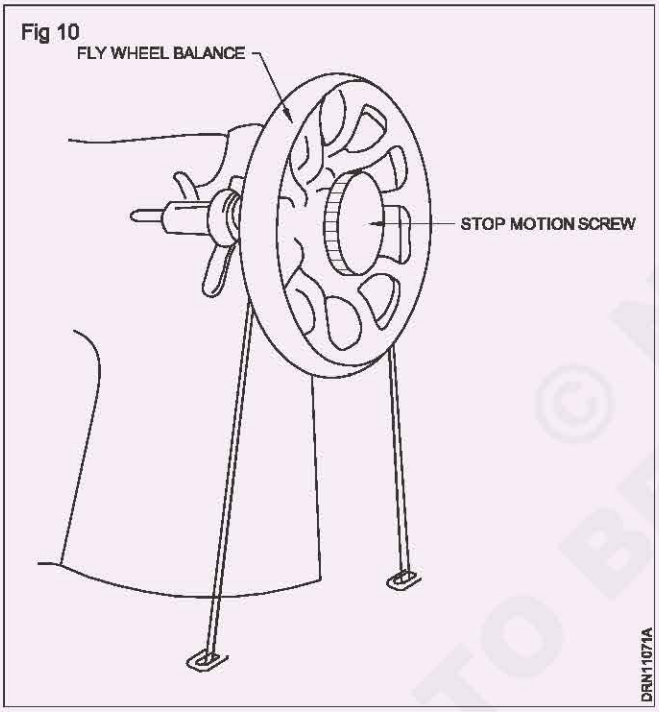
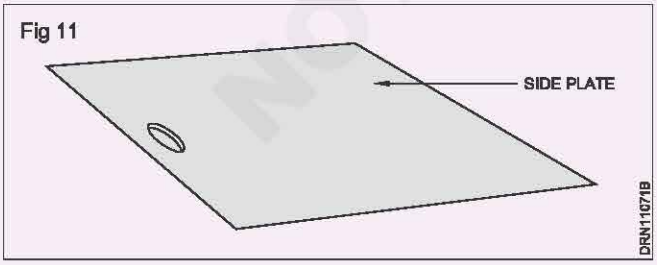



Fig 10




**Slide plate** is a rectangular plate that can be slide open to remove or insert the bobbin case. (Fig 11)

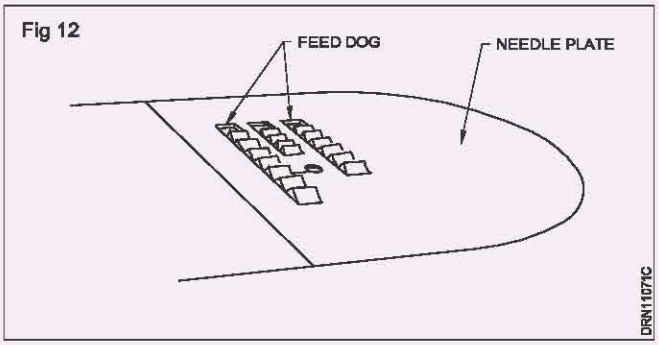
Fig 11




**Needle plate** or **throat plate** is a semi circular plate with a hole to allow the needle to pass through it. (Fig 12)

**Feed dog** consists of a set of teeth fitted below the needle plate. It helps to move the cloth forward while sewing. (Fig 12)

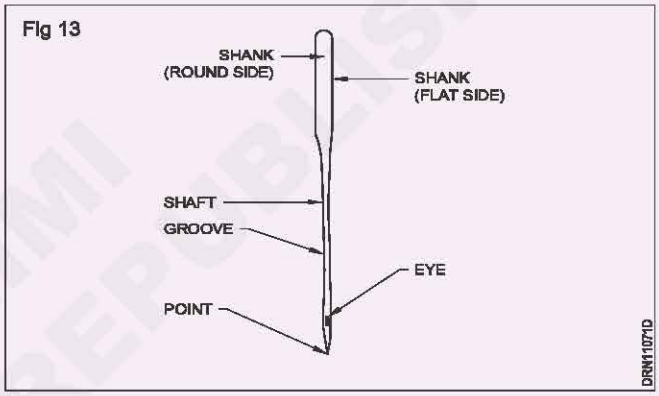
Fig 12




**Sewing machine needles** are of various types. Needles are selected according to their application. The sizes mainly depend on the structure of the fabric and the sewing threads used. The upper part of the needle is called the shank. The lower part is called the shaft.

One side of the shank is flat and the other side is round. On the round side is the groove, which guides the thread while forming the stitch and protects it against excessive friction. (Fig 13)

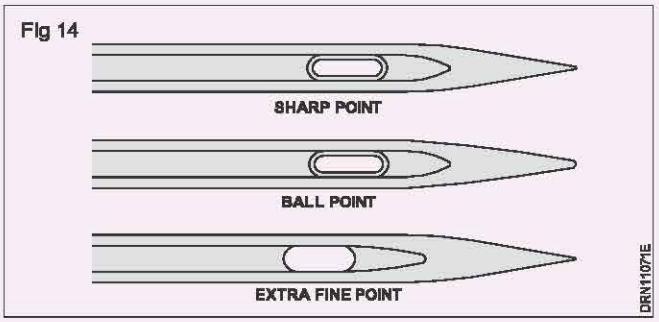
Fig 13




The eye of the needle is just above the sharp point. It is always extended in its length because the needle thread has to pass diagonally through the needle in the lengthwise direction. The needles have different points; each designed for a particular type of fabric.

The most commonly used are **sharp points** for woven fabric, **extra fine points** for twill, denim and heavy leather fabric and **ball point** for knit and stretch fabrics. (Fig 14)

Fig 14




The needle sizes range from 9 to 19. When selecting the needle, remember that finer the weight of the fabric and thread, the finer the needle should be.

**Care and maintenance of the machine:** Regular cleaning, oiling and care of the machine ensures satisfactory sewing and a long life for the machine. When not in use, keep your machine covered to prevent dust from settling on it.

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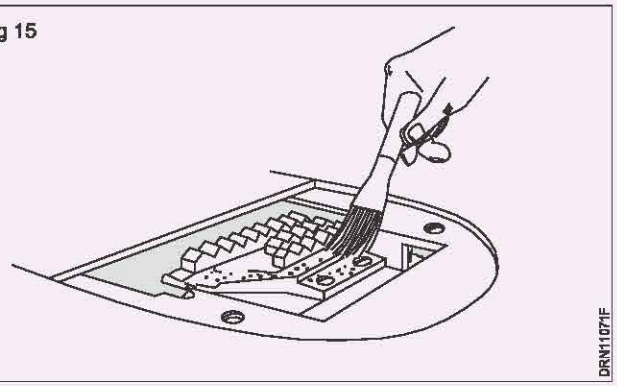
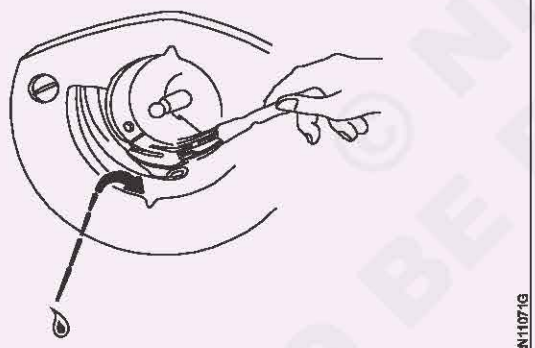
**Cleaning:** You should always remove lint deposits, dust and thread bits before oiling any part of the machine. Use a small dry brush or a toothbrush and a soft cloth to remove dust and lint. Use a pointed instrument like a needle to pick out bits of thread and lint that cannot be brushed out. To clean the feed dog remove the needle plate of the machine and brush off lint deposits and dirt sticking to the feed mechanism. (Fig 15)

Fig 15




To clean the shuttle race, remove the two screws holding the shuttle race assembly to the machine, take out the shuttle race, wipe its groove free of dirt, fluff and broken bits of thread. Sometimes loose thread wind around the rivets of the treadle and make the machine hard to run. You should remove thread bits caught in the wheel and all lint and dust sticking to the treadle part. (Fig 16)

Fig 16




**Oiling:** It is necessary to oil and lubricate the machine periodically. If the machine is used everyday, oil it once a week. If you use it infrequently then once a month should be sufficient. To oil thoroughly, remove the upper thread, needle plate, slide plate, faceplate, bobbin case, needle and presser foot.

Put special sewing machine oil in all oil holes and joints where one part rules against another. While oiling, turn the flywheel back and forth to help the oil flow to the moving parts (Fig 17 & 18).

After oiling the points on the head of the machine, tilt the machine head back to oil the points on the bed of the machine. It is essential to oil the shuttle race. On a treadle machine, the belt will have to be released before tilting the machine head back. (Fig 19)

**Do not forget to oil the machine stand (Fig 20)**

When the machine has been thoroughly oiled, wipe away excess oil and run it slowly for several minutes on a waste piece of material.

Fig 17

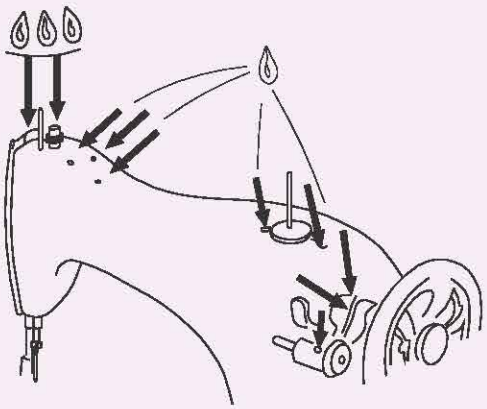



Fig 18

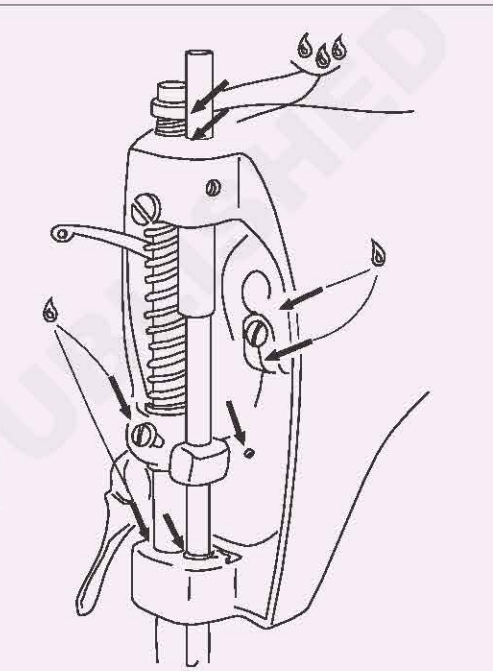
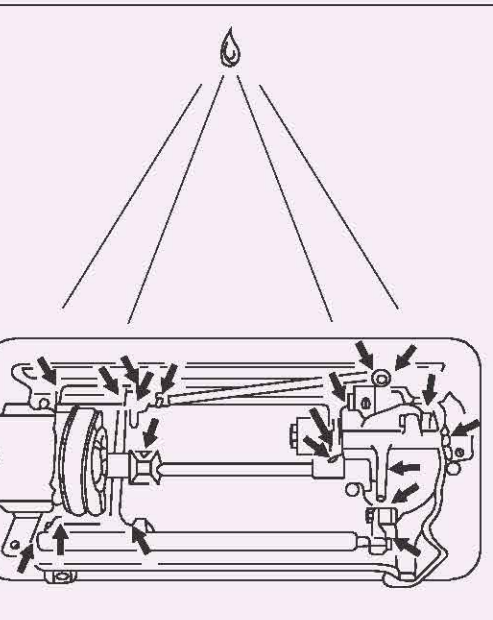



Fig 19

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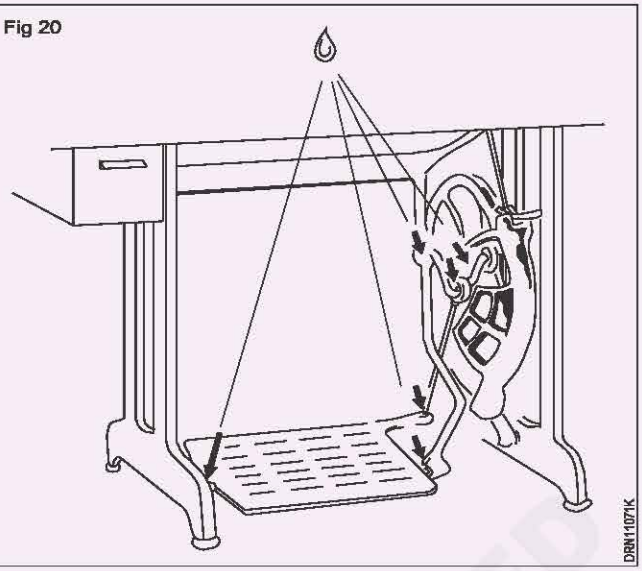
Before you close the machine, place a scrap of material under the pressure foot and lower the needle. The fabric will absorb the excess oil that might drain down through the machine and will prevent formation of oil spots on your work, when the machine is used.

If there is excess oil in the machine, put a drop of kerosene or petrol in each oil hole and joints and run it rapidly for several minutes. Then wipe off the oil that oozes out with a soft cloth and re-oil the machine. It will need a second oiling within a few hours after this treatment.

Fig 20




## Stitch formation/troubleshooting

**Objective**: At the end of this lesson you should be able to

- **explain the stitch formation, balance and stitch length**
- **explain machine troubles occurring while stitching with machine and name its rectification**
- **select needle and thread according to the fabric.**

**Stitch formation:** The needle thread loop, having been formed on the underside of the material by the needle, is interlocked with a second thread (underthread) by means of a hook.

The needle is inserted into the material.

As the needle moves upwards from its lowest position, the needle thread forms a loop which is caught by the point of the hook.

The hook enlarges the needle thread loop.

The needle thread loop is guided around the bottom thread spool.

Interlacing begins.

The take-up lever tightens the stitch into the material. The material is fed forward. (Fig 1)

**Stitch balance:** Before regulating the tension, make sure that the threading of the machine - top and under threading - is correct. When there is perfect balance of tension between the upper and lower threads, the stitches lock or meet together in the middle of the thickness of the cloth.

The stitches will look alike on either side of the work, both as to shape and tightness.

When the upper tension is too tight, the spool thread lies straight on top of the fabric and the under thread appears like loops on the upper side of the cloth.

When the upper tension is too loose, the under thread lies straight on the underside of the fabric and the top thread appears like loops on the underside.

An easy method of recognising tension is to stitch diagonally across a square of the fabric folded on true bias and then to stretch the cloth firmly between your fingers until one or both threads break.

The broken thread always is the one with tighter tension. If the tensions are balanced, both threads break together and require more force to break. If it is found that the tension needs adjustment, it is better to try to adjust the upper tension.

To increase or decrease upper tension, turn the screw on the tension regulator with the pressure foot down. In turning the screw remember that right is tight and left is loose.

Usually there will be numbers written on the tension dial. To increase tension you should turn towards the higher numbers (Fig 2) and to decrease, towards the lower numbers (Fig 3).

Do not move more than two numbers or a slight turn at a time. Then recheck the tension by stitching on a sample of fabric.

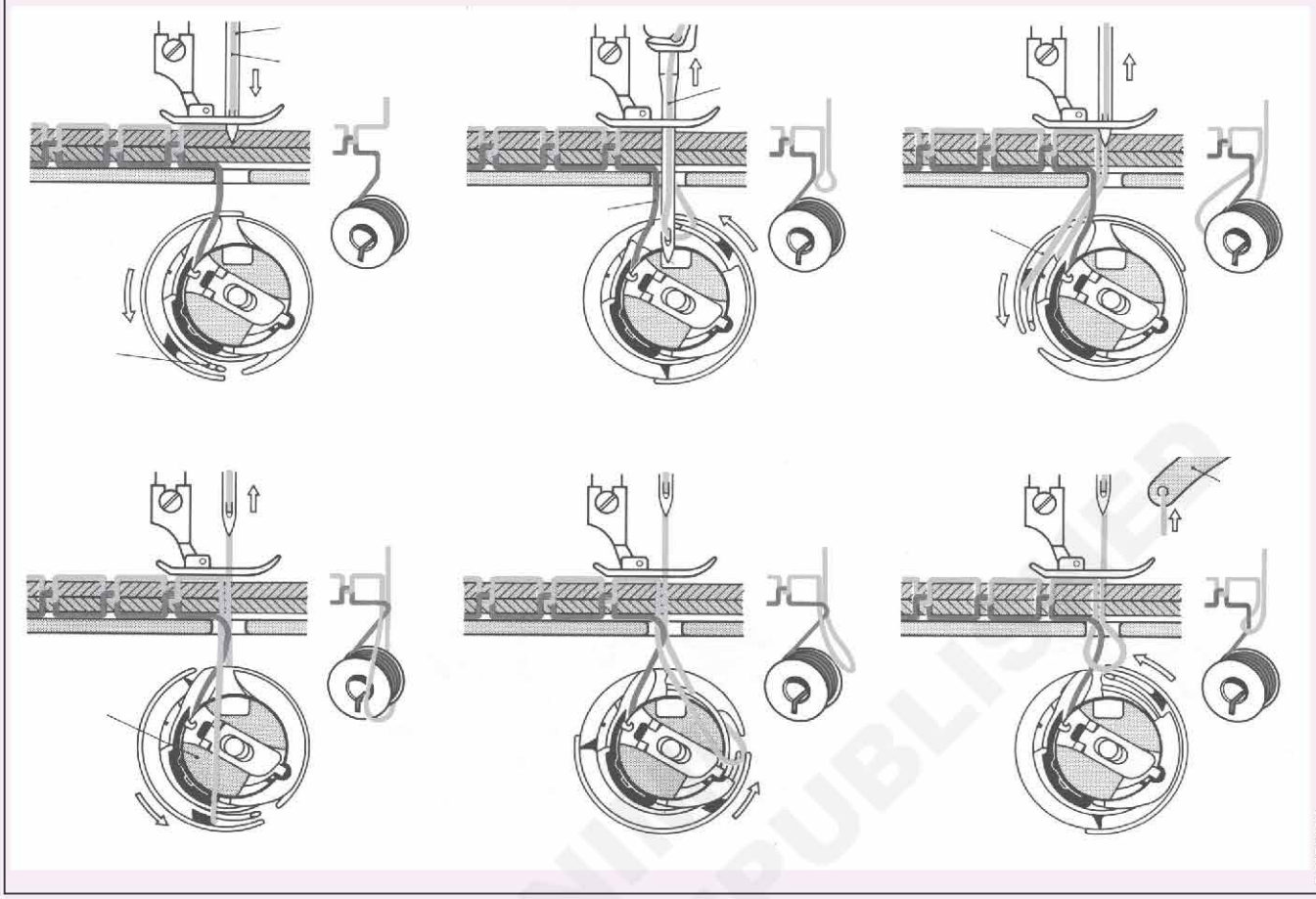
Avoid changing the lower tension unless you are sure that the tension cannot be corrected completely by adjusting the top one alone. The lower tension is adjusted by turning the small screw on the bobbin case using a screwdriver.

Usually the screw is turned to the right to tighten and onto the left to loosen. Make a very slight turn only each time. (Fig 4)

**Adjusting the stitch length:** The chart on this page gives the correct stitch length for various fabrics. In general, fine fabrics require a short stitch (16 to 20 stitches for 2.5 cm), medium weight fabrics, a medium stitch (12 for 2.5 cm) and heavy fabrics a long stitch (8 to 10 for 2.5 cm). For machine basting and machine gathering a still longer stitch (6 to 8 for 2.5 cm) is required.

**Selection of thread and needle:** A perfect stitch can be obtained only when the thread is selected to suit the

Fig 1




material to be stitched and the needle is of correct size. For stitching on thin fabrics use fine thread and fine needle. For heavy fabrics, needle and thread size should be larger.

Fig 2

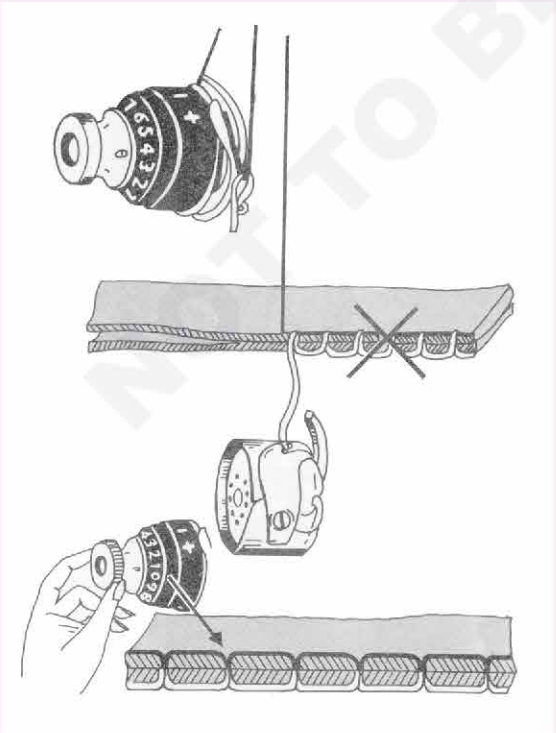
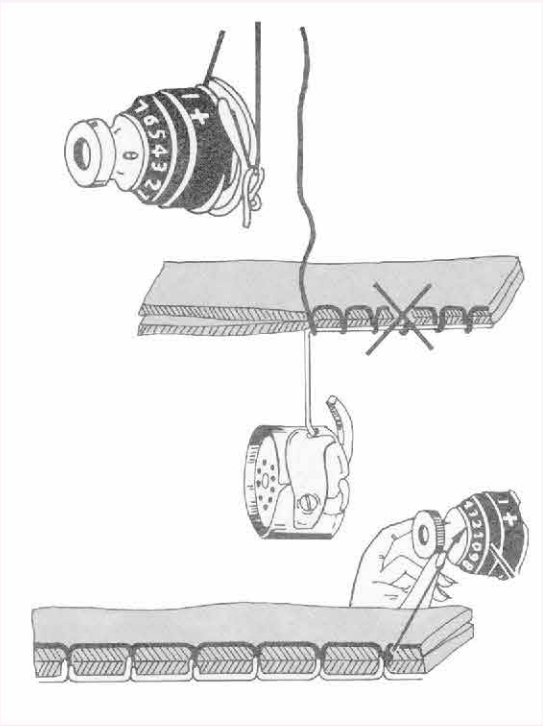



Fig 3

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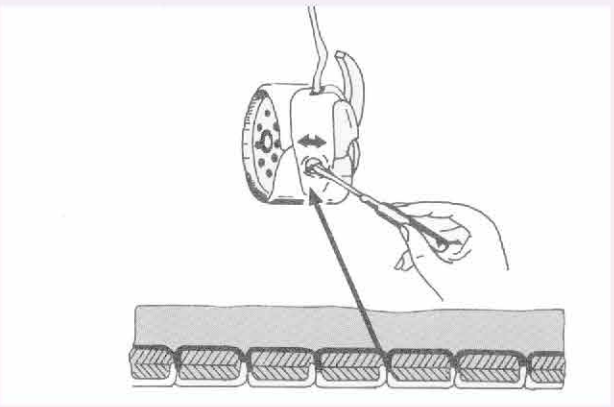
The table 1 will guide for the selection of appropriate needle and thread size. The last column in the table gives the approximate number of machine stitches per 2.5 cm.

Fig 4




## Stitch lines in different shapes (sewing machine practice)

**Objectives:** At the end of this lesson you should be able to

- **explain the importance of stitching by machine**
- **state about the different shapes of stitching lines in sewing machine.**

**Stitching by machine:** Sewing by machine is an art. It is an ultimate skill to be known to every dressmaker trainee primarily. Using a sewing machine for stitching involves some important techniques to be followed for perfection and accuracy in stitching. Adress maker attains perfection in stitching with continuous practice in machine stitching only.

The practice of machine stitching is done step by step. It ensures for the perfect use of the sewing machine by the dress maker. First it involves the pedaling process for easy running of the machine.

The machine is run by pedaling without needle and thread to acquire perfection. Later the machine is plugged and switched on to practice handling the machine with power. It requires more care as the functioning of the machine is more speedy with the motorised application.

Secondly, various shapes like vertical and horizontal lines, concentric squares circles etc are down on A4 size papers 1 in each.

Machine is set for stitching without threading. Every design drawn A4 paper is fed in machine to sew over it, in the order of various shapes.

The same shapes are drawn on fabric pieces. Finally, threads the sewing machine and practice stitching the fabrics one by one following the drawn shapes. This practice allows the trainee to handle the machine more efficiently and to control the machine speed as and when required.

**Troubleshooting while stitching with machine:**

Common troubles and their possible causes are listed below. You can take care of most of these yourself and in case of major troubles, the help of a qualified mechanic should be obtained.

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| Fault | Causes | Remedies |
|---|---|---|
| Tangled thread at the beginning | Bobbin too full. Bobbin set in wrongly. Under thread not drawn up. Both threads not pulled back under the presser foot, machine not properly oiled and cleaned. | Fill the bobbin just below the outer rim. Set the bobbin in correct position. Under thread should be drawn out. Take out both threads through the hole in the presser foot and leave it under the presser foot. Oil and clean periodically. |
| Skipped stitches | Needle bent. Needle set to wrong side. Needle set with long groove turned inserted too high or too low in the needle bar. Needle too small. Needle threaded from the wrong side. Excess oil on shuttle. | Check and fix the needle in a correct position. Check whether it is threaded properly. Stitch with a scrap of material to remove excess oil. |
| Upper thread breaking | Poor thread. Machine incorrectly threaded. Needle set on wrong side. Needle too fine. for thread. Needle threaded from the wrong side. Upper tension too tight. Sharp edge on needle plate hole or shuttle thread. Take-up spring broken. | Select an appropriate (correct) thread and needle. Thread the needle properly. Check the upper tension and the hole in the needle plate (which should be smooth) and also for take up spring. |
| Lower thread breaking | Poor thread. Lower tension too tight. Bobbin case threaded wrongly. Sharp edge on the needle plate. Bobbin would too full or uneven. Dirt in the bobbin case. | Clean the bobbin case and select the correct thread and wind it uniformly. Check the lower tension and check for a smooth hole in the needle plate. |
| Fabric puckering | One or both tensions too tight. Stitches too long for material being sewn. Blunt needle. | Select the correct needle. Check for both tensions. Fix the stitch length accurate to the fabric. |
| Needle breaking | Incorrect size of needle for thread and fabric. Needle bent. Pulling of material while stitching. Presser foot incorrectly set. Crossing a thick seam using a too small needle. | Set the presser foot properly. Select appropriate needle and thread to match the fabric. Fabric should not be pulled out while stitching. |
| Staggered stitches | Too little pressure on presser foot. Take-up spring weak, broken or missing. | Check the pressure on the presser foot and also for the take up spring. |
| Uneven stitch length | Incorrect presser foot pressure. Feed dog dirty or worn out. | Check the pressure of the presser foot. Clean and check the feed dog. |
| Material not feeding correctly | Stitch regulator set too close to 'O' point. Dirt under needle plate near feed dog. Incorrect presser foot pressure. Bent pressure foot. | Stitch regulator should be set to a correct number to match the fabric. Clean the feed dog and the lower side of the needle plate. Check the presser foot and its pressure. |
| Machine runs heavily | Lack of oil. Thread wound around the wheel or treadle bearings. Belt too tight. Bobbin winder pressed down. Thread jammed in shuttle race. Gummed oil or dirt on bearings. | Oil the machine periodically, clean the wheel and treadle bearing. Check the belt tension release the bobbin winder. Clean the shuttle race. Use only sewing machine oil. |

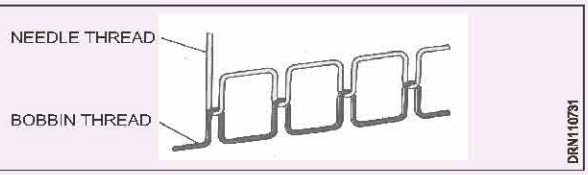
# Motorised sewing machines

**Objectives:** At the end of this lesson you should be able to
- **state two types of machine stitch formation**
- **identify the parts of motorised sewing machine**
- **state the maintenance aspects of motorised sewing machines.**

Motorised sewing machines can be classified according to the stitch formation they produce.

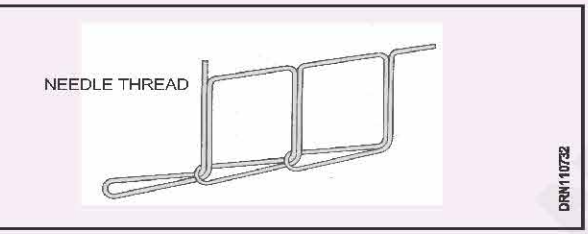
**Lock stitch machine** is the common machine used in domestic tailoring and industrial production. The stitch is formed by interlocking two threads. This machine is distinguished by the winding device provided for the bottom thread (Bobbin thread). (Fig 1)

Fig 1



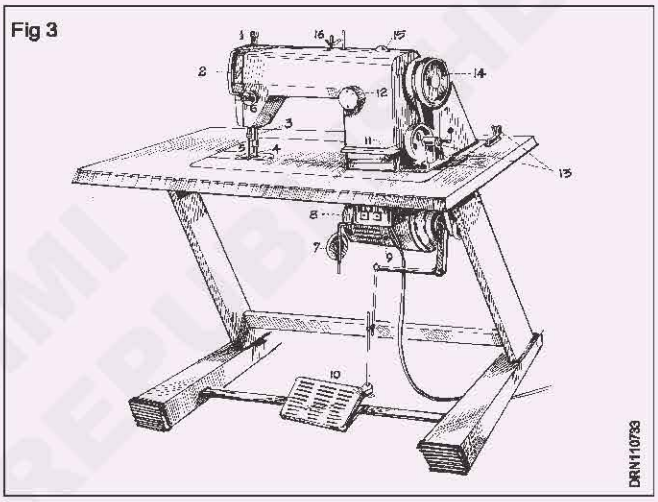

**Chain stitch machine** uses only needle thread, forming a chain of loops. It is distinguished by the thread tension device placed on the arm and the absence of a spool winder. (Fig 2)

Fig 2




**Parts of the motorised lock stitch sewing machine**
- Presser foot lever (1)
- Thread take up lever (2)
- Needle bar (3)
- Presser foot (4)
- Needle (5)
- Presser spring regulator set (6)
- Knee lifter (presser foot lifter by knee) (7)
- Power switch (8)
- Motor (0.25HP) (9)
- Accelerator (10)
- Back tack lever (11)
- Stitch regulator (12)
- Thread winder (Bobbin) (13)
- Balancing wheel (14)
- Sight glass (15)
- Thread tension (16) (Fig 3)

Fig 3




**Maintenance:** After each use, the lint and the dust must be removed. Cover the machine when not in use. Periodic oiling and greasing should be done. Take particular care of the electric power cord and plug and have them repaired at first sign of problem.

# Zig-zag machine/ attachment

**Objectives:** At the end of this lesson you shall be able to
- **explain the formation of zig-zag stitch**
- **name important parts of the zig-zag equipment and explain its function**
- **set width and length of zig-zag stitch.**

The zig-zag sewing machine is a motorised sewing machine which requires some experience in handling to control the speed of sewing. Some power sewing machines have an in-built zig-zag facility. Apart from ordinary sewing machines, these machines have some additional parts and functions.

The machine has extra features like reverse stitch which helps to overcome the problem of turning the fabric every now and then. It has a powerful sewing light which gives more visibility while stitching. It also has a facility to perform zig-zag stitches in various patterns for functional (e.g. buttonhole stitching) and decorative purpose. The appearance of the zig-zag stitch as a decorative stitch is very close to the satin stitch.

A buttonhole foot (all-purpose presser foot) and an all purpose needle plate have to be fixed for zig-zag stitching.

Both attachments have a wider needle opening. While performing the stitch, the needle not only moves up and down but sews also from left to right. The shuttle race moves correspondingly to help forming the stitches while the fabric moves forward at the same time. (Fig 1)

Width and length (distance between the single stitches) of zig-zag stitch can be manipulated in order to create different designs. (Fig 2)

The stitch length is controlled with the help of the stitch regulator knob. If the knob is set on or close to '0' the stitch will look like a satin stitch. (Fig 3)

Fig 1

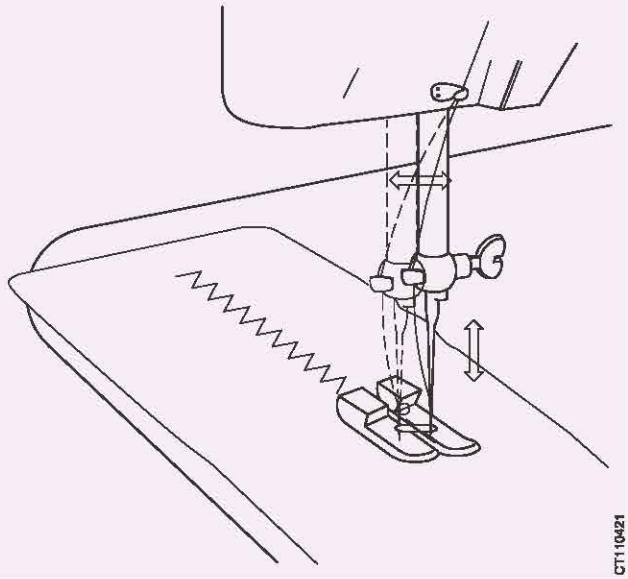
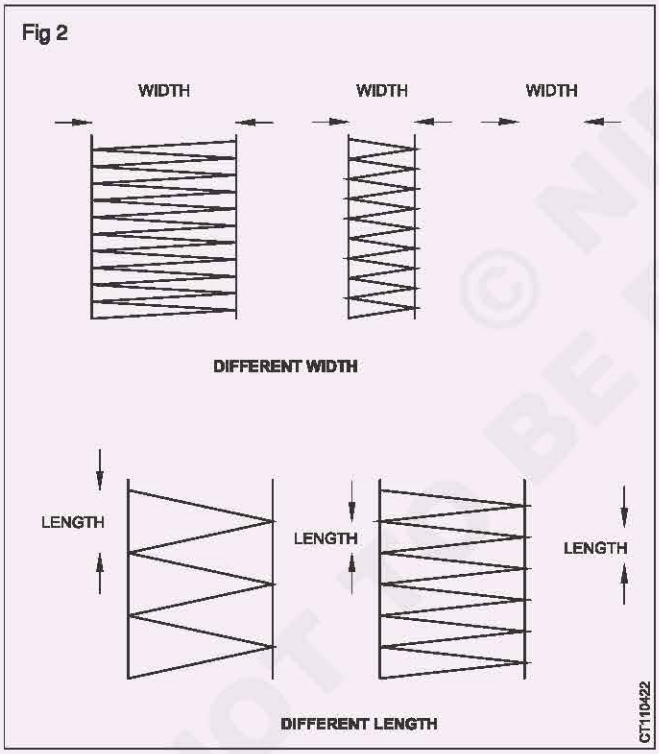



Fig 2




To set the width of the zig-zag stitch, you have to operate the zig-zag width lever. (Fig 4)

If you want to set the lever on a width marked as '3' on the scale first you have to unscrew the two control buttons. (Fig 5)

Then slide the lever on '3'. To keep the lever in a fixed position, the two side limiters have to be adjusted also. Position the left limiter by hand close to the lever and clamp the left control button. (In some machines the left side limiter is attached to the lever). (Fig 6)

Fig 3

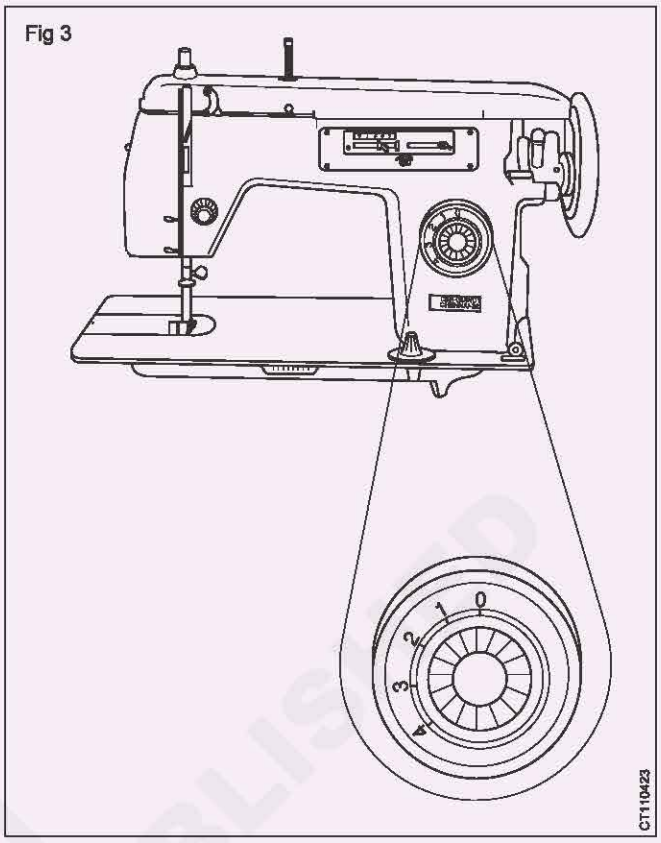



Fig 4

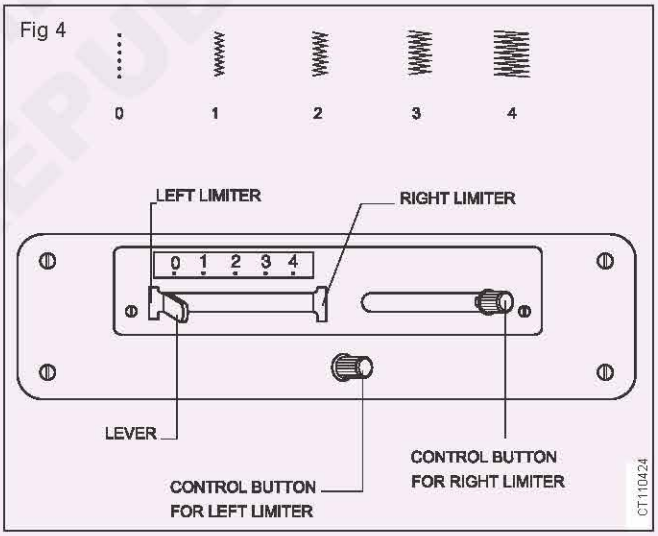



Fig 5

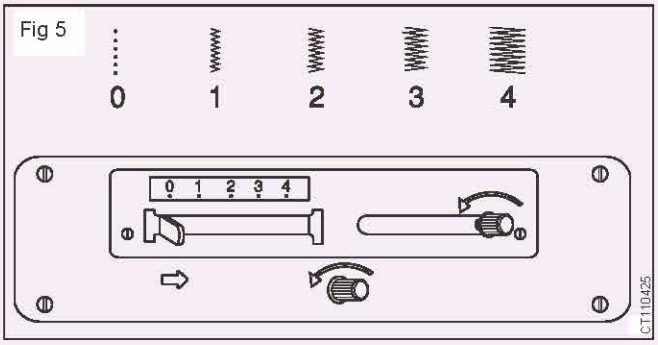



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Fig 6

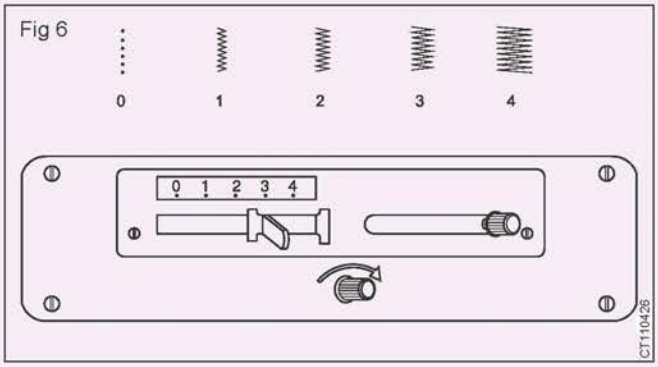
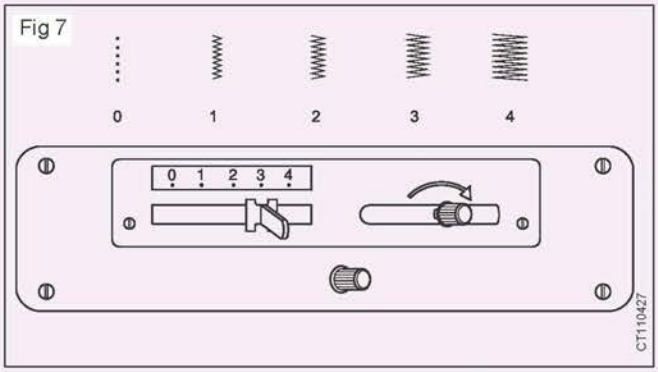



Fig 7



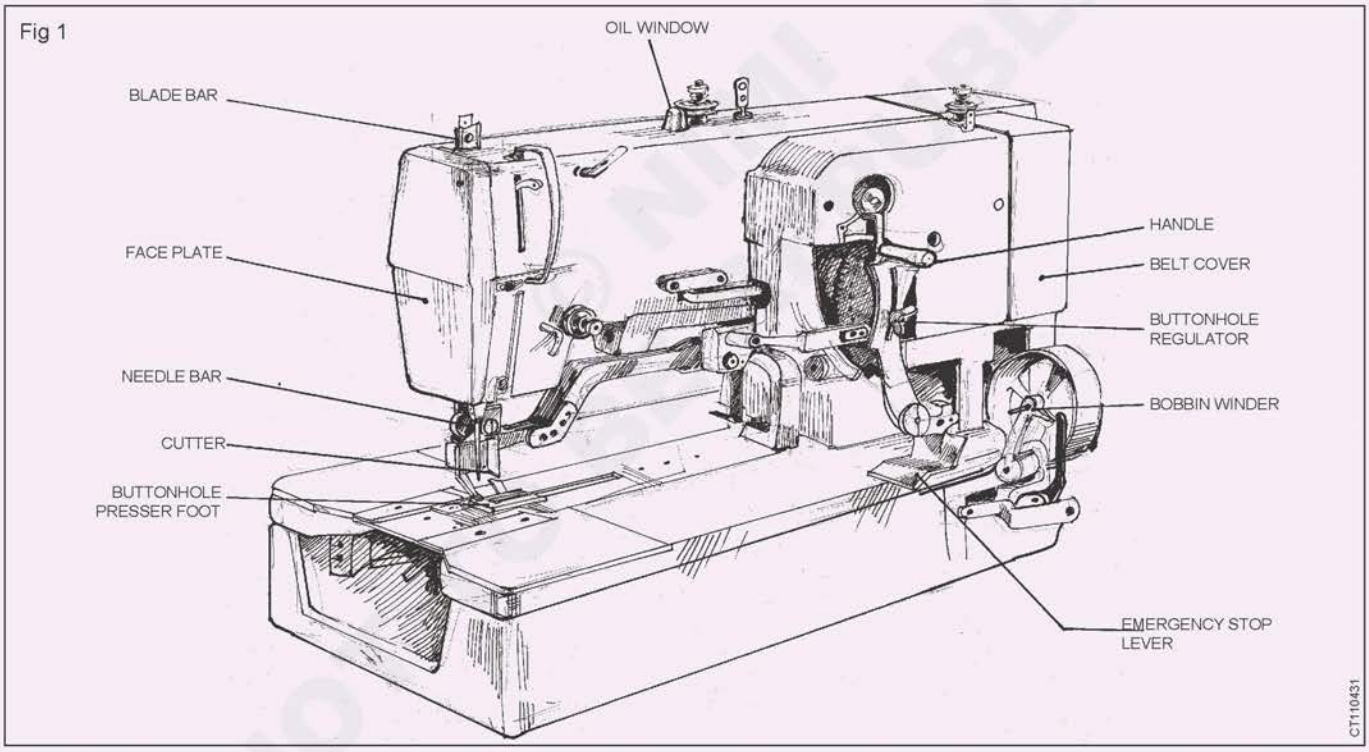

Set the right limiter close to the lever while shifting the right control button to the left until the final position of the right limiter is reached. Clamp the control button. (Fig 7)

## Buttonhole machine

**Objectives:** At the end of this lesson you shall be able to
- **name the main parts of the buttonhole machine**
- **explain their functions**
- **explain the use of buttonhole scissors.**

**Buttonhole machine and its parts** (Fig 1)

Fig 1




The **cutter blade** helps to cut the buttonhole after it is worked. The blade width varies from 8 mm to 32 mm. The blade length can be adjusted according to the button size. The presser foot is of rectangular in shape. Center space is provided to form a zig-zag stitch. (Fig 2)

The emergency stop lever is used to stop the machine at any time during stitching.

The **buttonhole regulator** selects the desired stitch length on which the stitches of buttonholes are set. The machine will stitch automatically according to the selected length of stitch. (Fig 3)

The **blade bar** will be selected according to the desired buttonhole length. After completing the buttonhole stitch, the length of the buttonhole is cut automatically.

Threading the machine with the upper thread is shown in Fig 4.

### Safety precautions while using buttonhole machine

- **Keep hands a little away from the sewing area to avoid hand injury.**
- **Ensure that there is no electrical leakage before starting to work on the machine.**

Fig 2

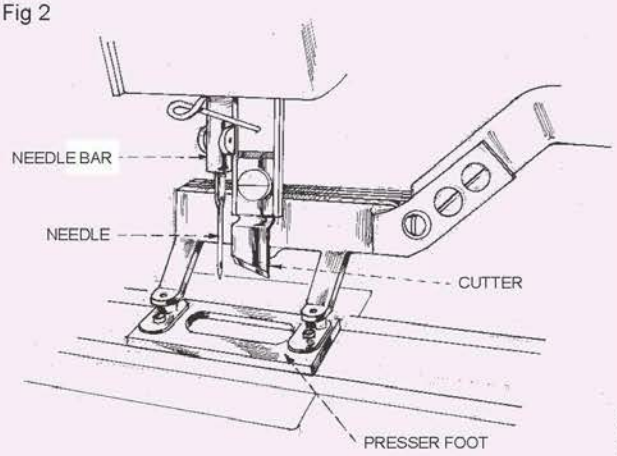



Fig 3

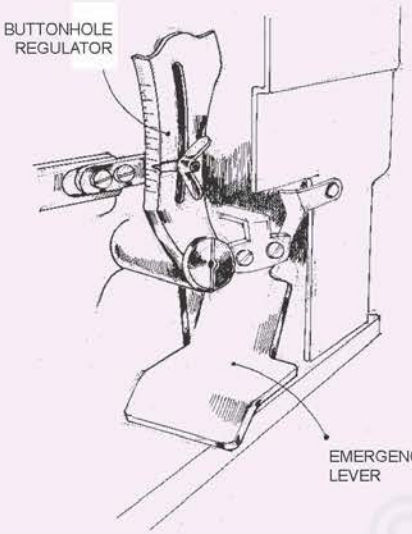
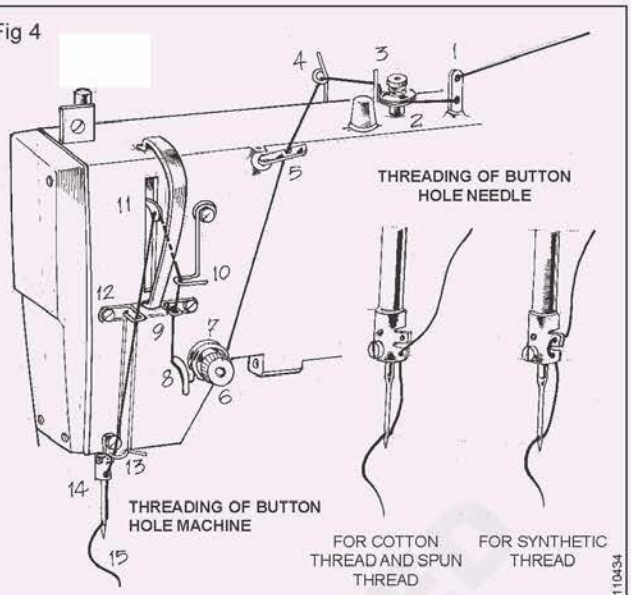
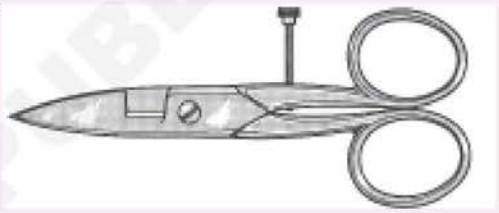



Fig 4


THREADING OF BUTTON HOLE NEEDLE
THREADING OF BUTTON HOLE MACHINE
FOR COTTON THREAD AND SPUN THREAD
FOR SYNTHETIC THREAD
CT110434

**Buttonholes scissors** have a special gap in the blades which allows shortcuts to be made inside the edge of the fabric. The length of the cut can be adjusted by a screw. (Fig 5) It is used for horizontal buttonholes.

Fig 5

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# Overlock machine - 3 thread

**Objectives:** At the end of this lesson you shall be able to
- **state the use of overlock machine**
- **state the different parts of the overlock machine.**

**Over lock Machines:** Over lock machines a special purpose machine used for finishing edges and sometimes for seaming. It falls under the class 500, which means stitches are formed with one or more groups of threads and have a general characteristics that loops from at least one group of threads pass around the edge of the material.

Over lock sewing machines are usually runs at high speeds, from 1000 to 9001 rpm and mostly are used in industry for edging , hemming and seaming a variety of fabrics and products. Overlock stitches are also used for decoration, reinforcement or construction.

**Types of Over lock stitches:** Over lock machines are generally made in 1,2,3, 4 or 5 thread formations. Each formation has unique uses and benefits -

1 **One Thread Overlock:** End to end seaming or "butt-seaming' of piece goods for textile finishing.

2 **Two Thread Overlock:** Stitch type 503. Machine has one needle & one looper. Used for edging and seaming, especially on knits & woven, finishing seam edges, stitching flat lock seams, stitching elastic and laces to lingerie and hemming. Stitches can be adjusted to sew a rolled hem.

3 **Three thread Overlock:** Stitch type 504. Machine has one needle and two loopers. Used for finishing edges or decorative edging and seaming knit or woven fabric. This is a most common overedging having excellent stretch & recovery. Here stitches looks the same on both the sides.

4 **Four Thread Over lock:** Machine has two needles & two loopers. It will stitch a chain stitch or a safety stitch Decorative edging and finishing, seaming high stress areas, mock safety stitches which create extra strength while retaining flexibility. Suitable for both knits & woven. Machine can be converted to two thread or three thread overlock.

5. **Five Thread Overlock:** Machine has two needles & three loopers. It is two thread chain stitch combined with a three thread overlock. The left needle and lower looper form a two thread chain stitch. For every unit length of stitch it requires 20 times of thread length.

Securing the raw edges of a seam allowance with overlock machine is a very fast way of finishing. Overlock machine can also be used to sew two pieces of fabric together (e.g. knit garments). It cuts the edges and secures them in one operation.

**Overlock machines** come in different models but all are basically similar. The machine shown here is a three-thread overlock machine working with two knives - a moving upper knife and a fixed lower knife. They cut off frayed fabric edges to give a neat finish.

**Parts of the machine (Fig 1)**

- Needle bar (1)
- Thumb screw (to regulate pressure of the presser foot) (2)
- Thread cutter (3)
- Presser foot (4)
- Needle (5)
- Tension set (for needle) (6)
- Tension set (for overlooper) (7)
- Tension set (for underlooper) (8)
- Cloth plate (9)
- Slide cover (10)
- Hand wheel (rotates in clockwise direction) (11)
- Feed ratio (12)
- Sight glass (oil window) (13)
  - indicates lubrication of the mechanism
  - indicates the level of the oil in oil tank
- Lower and upper knife (14)

**Lower and upper knife** are fixed in the opposite direction with the sharper edges meeting each other so that the fabric will get cut with each movement. Sharp edges of the knifes overlap around 0.5 - 1 mm depth (Fig 2).

Fig 2

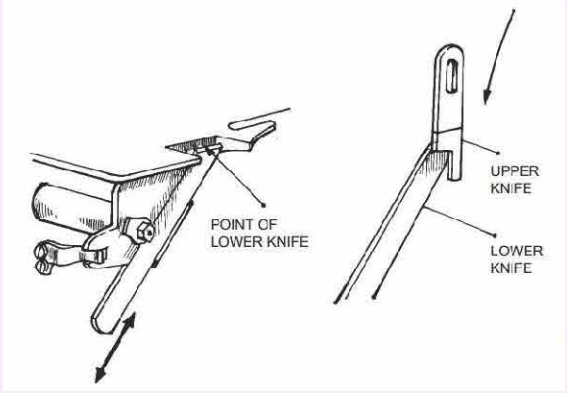


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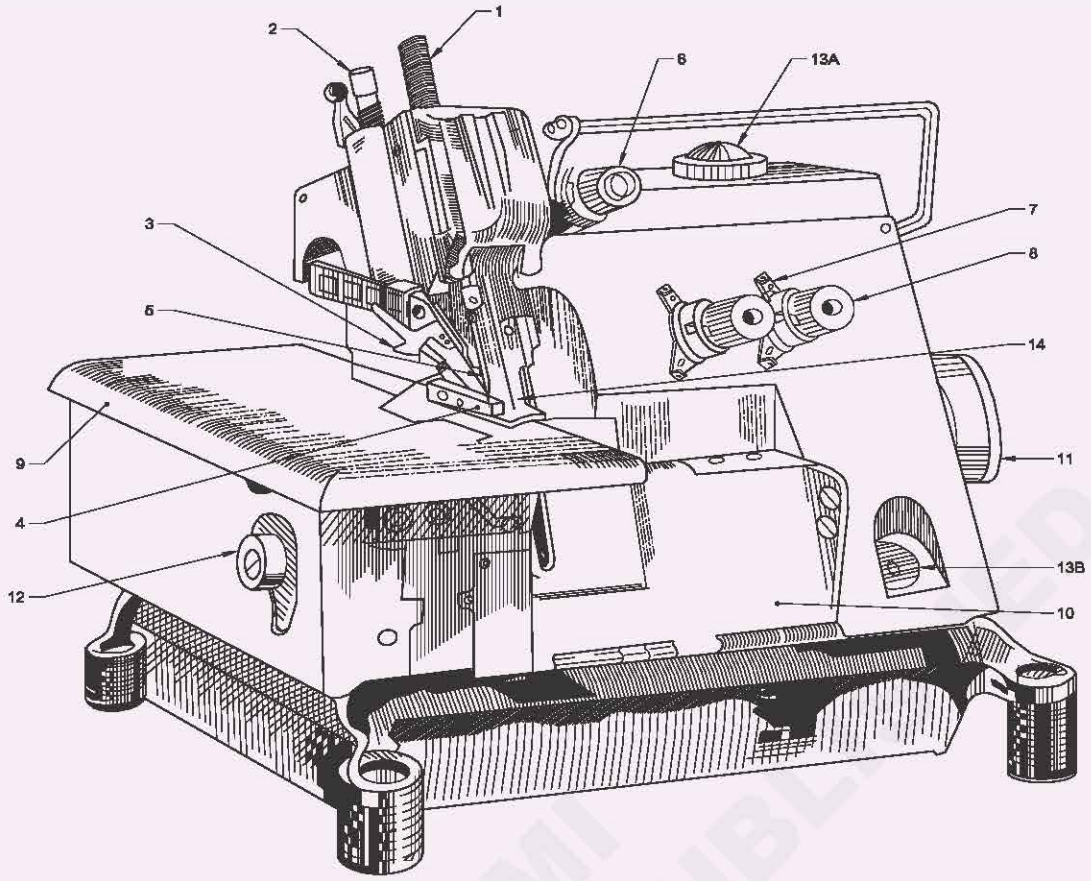
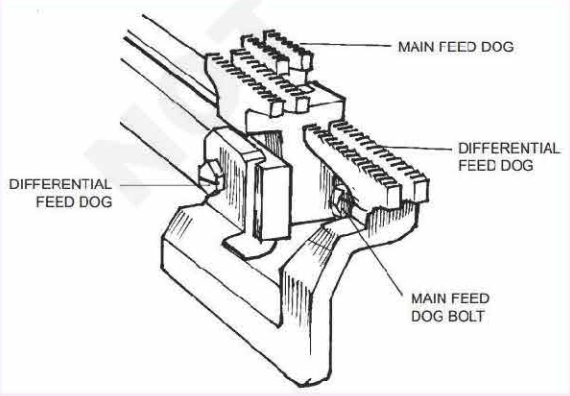
Fig 1




The overlock machine has two feed dogs, the main feed dog and the differential feed dog. (Fig 3) The levels of these two should be equal with one another and the height can be adjusted independently by the respective bolts. The height of the feed dog must be adjusted according to the thickness of the material.

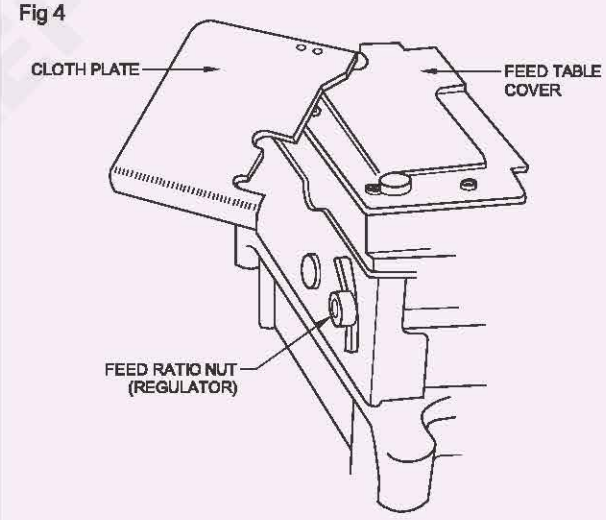
| | |
|---|---|
| 1 mm | for thin materials |
| 1.3 mm | for medium thick materials and |
| 1.5 mm | for thick material, also raised above the top of the needle plate. (Fig 3) |

Fig 3




**Feed ratio nut regulator** increases and decreases the teeth of the feed dog to get shirring and stretching stitches (Fig 4).

Fig 4




**Threading of overlock machine:** Threading of the overlock machine is strictly complicated compared with other sewing machines. The one shown in the graphic has three different threads: the needle thread (I), the overlooper thread (II), the underlooper thread (III). The sequences of guiding these three threads can be followed as in the diagram. (Fig 5)

After each use the lint and dust has to be removed. Cover the machine when not in use. Periodic oiling and greasing should be done.

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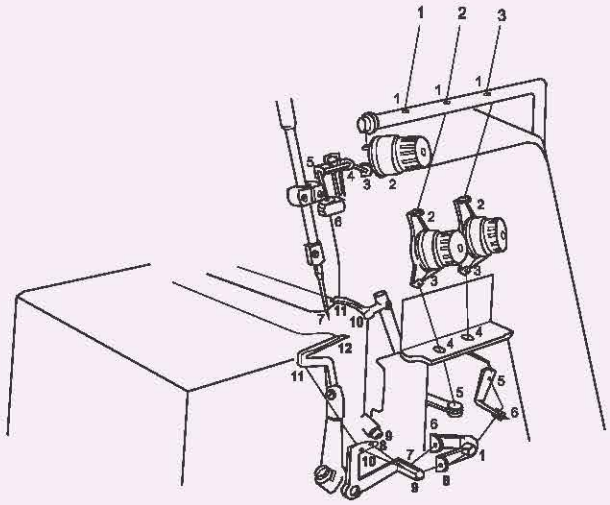
Fig 5



**Basic Garment Analysis:**

Most apparel professionals engage in some type of garment analysis, either formal or informal, as part of their job responsibilities. Garment analysis procedures differ depending on who performs the analysis, the purpose of the analysis, and the methods of analysis that are employed. Both consumers and Apparel professionals do garment analysis. Consumers engage in garment analysis every time they shop for apparel. The thoroughness of the analysis depends in large part of the type of garment being sought and consumer's product knowledge.

Consumers perceptions of products may be based on intrinsic or extrinsic cues to quality and performance depending on personal preferences or priorities. Purchase made by the customers determine the success of the decisions made by the apparel professionals.

**Classifications of Garment Analysis:**

- Professional Garment Analysis.
- Methods of Garment Analysis.
- Process of Garment Analysis and specification development.
- Style description.
- Sizing and fit.
- Materials selection.
- Garment component Assembly.
- Final garment assembly and finishing.
- Style presentation.
- Summary.

**Professional Garment Analysis:**

- Professional Garment Analysis involves the following goals, processes, and limitations:
- Products are examined from a business perspective with the goal or positioning products to satisfy the needs of target customers.
- Decisions are made in the context of the product line and the firm's strategic plan.
- Products are developed and marketed to suit groups of target customers in terms of styling, fit, fashion, quality, and value.
- Sound technical knowledge of materials and garment assembly is needed to determine product performance.
- Alternative product development, production, and/or marketing processes are assessed.
- The bottom line, the potential profitability of the product, is always considered in evaluating alternatives.
- Quality standards are based on perceptions of target customers exceptions.
- Analysis standards are based on perceptions of target customers expectations.
- The results of professional analysis determine what will be available to consumers of the retail sales floor.

**Methods of Garment Analysis:**

Three different methods of analysis that could be used are these;

- Visual inspection.
- Augumented visual inspection, aided by simple tests, simple magnification and measuring equipment, and/ or home laundry equipment.
- Laboratory analysis with standard test methods, specialized testing equipment, high-power magnification, and highly calibrated measuring equipment.

**1 Visual inspection**

It is effective in evaluating overall garment appearance and aesthetics, estimating fabric quality, identifying stitch and seam types, and estimating number of stitches(spi).

A skill person can conduct a quick and reasonably reliable assessment of these product characteristics using visual inspection.

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Experience in garment analysis develops the ability to see and feel quality products. Skills are developed through comparing similar characteristics and performance of a wide variety of products.

Consumers and retail buyers, when viewing product lines for the first time, frequently use visual inspection. The reliability of visual analysis is completely dependent on the skill of the individual conducting the analysis.

**2 Agumented visual inspection**

Provides more information and increases the ability to reach reliable conclusions. Simple burning or solubility tests might be used to verify fiber content. Use of microscopes or pic glasses increases the details that can be observed in fabric structures relative to interlacing patterns, yarn types, yarn twists, methods of color application, and so on.

Use of home laundry equipment can provide insight into latent defects such as color bleeding and shrinkage.

Both visual inspection and agumented visual inspection can often be performed without destroying the product. Use of standard tests and calabrated equipment increases the costs of the analysis but also the amount of information available.

**3 Laboratory analysis with standard test methods**

The most scientific garment analysis involves laboratory tests of the products and materials. laboratory tests with standard test methods endorsed by the American society for testing and materials (ASTM). The American association of chemists and colorists (AATCC) or other professional organizations and controlled laboratory conditions provide the most reliable results.

Shrinkage, strength, abrasion resistance, air-permeability, colorfastness, and shading, analysis of these compatibility of materials and suitability to particular end uses.

Tests are frequently destructive, and extra materials and garments must be sampled according to specified methods

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# Seams

**Objectives:** At the end of this lesson you shall be able to
- **name the features and applications of seams and seam finishes**
- **explain the supporting techniques for a good seam construction.**

Seaming is a method of joining two or more pieces of fabric by a row of stitches. Stitching seam belongs to the basic and structural activities for construction of garments. If the purpose of a seam is mainly functional it is called a **constructional seam**, like side seam, underarm seam, waistline seam etc.

These seams must be inconspicious and as flat as possible. Beside of that, there are **decorative seams** which are made conspicious to give a design or decoration to the garment, like piped seam, corded seam, flat and felled seam or topstitched seam.

The direction in which seams are stitched in general, is from the wider part of the garment to the narrower, because grain lines can be matched easier in this direction. A side seam of sleeve for example will be stitched from the armhole to the sleeve bottom.

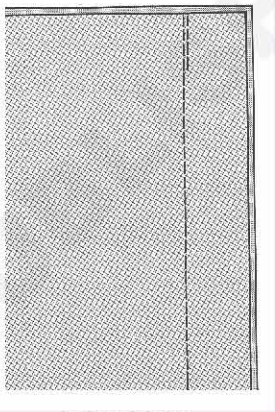
Only in piled fabric the seams are stitched always with the direction of the pile, irrespective of the garment being wide or narrow at the starting point. Most of the seams are stitched with right sides of the fabric together. Seams should be back stitched at the beginning and at the end for reinforcement.

**Seams are of three types**

1 Plain seam - Plain seam are again of three types -
   a Straight seam
   b Curved Seam
   c Cornered seam
2 Self Enclosed Seam - Self enclosed seams are those in which all seam allowances are contained within the finished seam, thus avoiding the necessity of a separate seam finish. Self enclosed seam are of the following type -
   a The French Seam
   b Mock French Seam
   c Flat Felled seam
   d Self Bound Seam
3 Topstitching Seams - Seams are topstitched from the right side with seam allowances caught into the stitching. Topstitching is to hold the seam allowances flat, to add interest to plain Fabric and to keep the under layers flat and secure. Topstitching seams are of the following types -
   a Double Topstitched seam.
   b Welt Seam
   c Tucked Seam
   d Slot Seam
   e Faggoted Seam

Seams can be constructed in different shapes. The **straight seam** is the most basic and easiest to stitch. (Fig 1) The seam allowances can be pressed to one side and finished together (in light weight fabrics) or they are pressed open and finished separately.

Fig 1

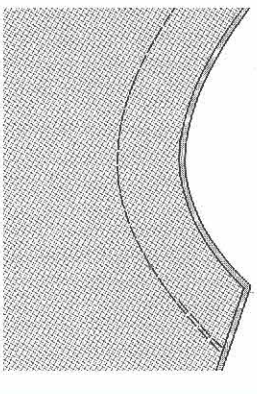


STRAIGHT SEAM

DRN121511

**Curved seams** require careful attention in handling and shaping. Use a shorter stitch length and a slow speed to get well shaped curves and to ensure extra strength. (Fig 2)

Fig 2



CURVED SEAM

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**Cornered seam** is reinforced by using a shorter stitch length on either side of the corner. Accurate pivoting is important to get an accurate corner. (Fig 3)

**Supporting seam techniques:** Some additional seam techniques ensure a better fit of seams as there are:

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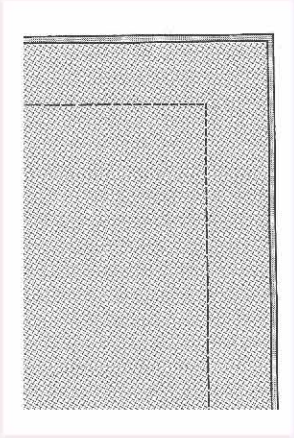
Fig 3

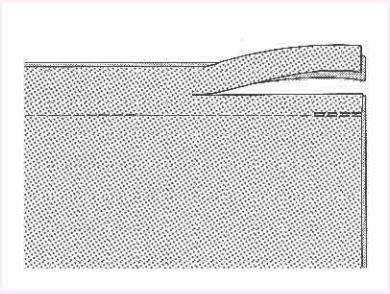


A CORNERED SEAM

DRN121513

**Trimming** means cutting away some of the seam allowance. This is done to reduce bulk in order to get a better fit (for example at the armhole) or to prepare the seam for further construction (e.g. french seam). (Fig 4)

Fig 4

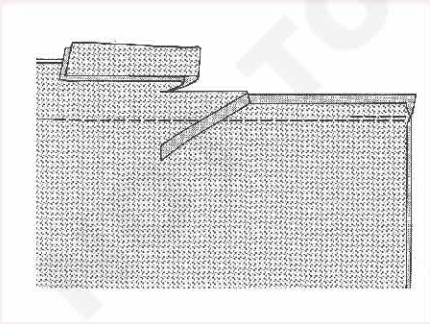


TRIMMING

DRN121514

**Grading** is a variation of trimming. It is done where bulky seams cannot be pressed open. The fabric layers of the seam allowances are trimmed to different width to avoid a thick ridge at the edge. The widest layer should set nearest the garment. This helps the seams to lie flat without causing a bulky ridge (for example in enclosed seams). (Fig 5)

Fig 5

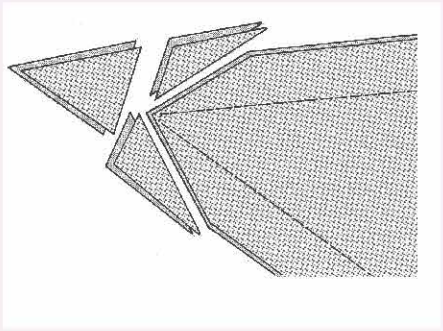


GRADING

DRN121515

**Trim a corner:** Corners of enclosed seams must also be trimmed to reduce the bulk. First trim seam allowance on point slightly away from the stitch line. Then trim the sides tapering to point. (Fig 6)

Fig 6

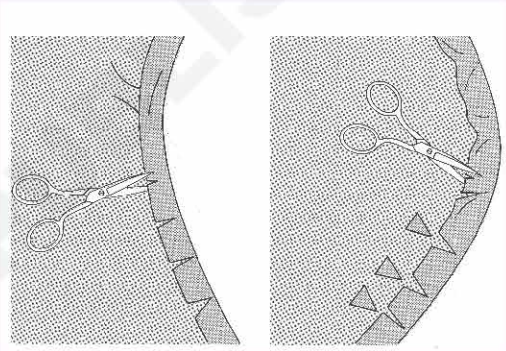


TRIM A CORNER

DRN121516

**Clipping and notches:** In seam allowances with inward curves and corners, **notches** help to remove bulk of fabric. In outward curves and corners, clipping the seam allowance allows the fabric spread out to lie flat. (Fig 7)

Fig 7



CLIPPING AND NOTCHING

DRN121517

**Seam finish** is given to the seam edge to prevent the fabric from fraying and to provide a neat look. The type of seam finish choosen depends on the type of fabric, its weight, its weave etc. and wear and tear of a garment; it is not required in lined garments. Some seam finish is given on the edge of the seam allowance, like overcasting, pinking, overlocking, hongkong and bias bound seam finishing. The other method is to enclose the seam allowance, so that it is not visible any more, like in french seam, self-bound seam, flat and felled seam. For enclosed seams, more seam allowance is required. This seam finish is suitable in straight seams and in light to medium weight fabrics. Trimming and pressing are important steps in finishing enclosed seams.

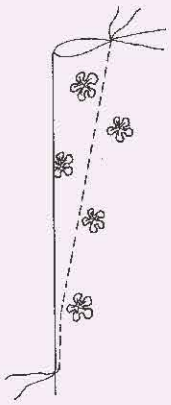
# Darts

**Objectives:** At the end of this lesson you shall be able to
- **name the types of darts and explain their constructional features**
- **explain important construction techniques**
- **state the application of tracing wheel.**

Darts are one of the most basic structural elements in dressmaking. Darts are necessary because the body is not straight and flat but curved. A dart is used to shape a garment around the contours of the body and to allow freedom of movement, comfort to the wearer and also to make the garment look attractive. Darts are used mainly on women's dresses to allow fullness at the bust, hips, shoulders and elbows.

**Standard dart (half dart):** It is triangular in shape, wide at one end and pointed at the other. (Fig 1)

Fig 1



HALF DART
(SINGLE POINT DART)

DRN121611

The pointed side should always be directed to the fullest part of the body. Tacking and stitching should start from the wide end towards the dart point. The wide base of a dart takes in fabric fullness, so that a garment fits the narrower parts of the body. The space inside the triangle is called intake which will appear on the wrong side of the garment. The dart stitching lines are matched, then stitched together. These stitching lines can be straight or gently curved for a close fit around the shape of the body. (Fig 2)

**Double pointed darts (full darts):** These are wide in the middle and pointed at both ends. (Fig 3) They are used at waist line of one-piece dresses.

After stitching, vertical darts are pressed towards centre front or centre back, and horizontal darts are pressed downwards.

In general, it is better to set two small darts than one large dart.

A very deep and bulky dart intake is slashed and pressed open, the edges are overcasted or pinked. These darts are called **slashed darts**. (Fig 4)

Fig 2

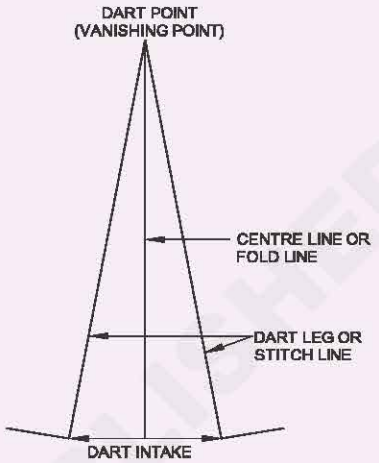



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Fig 3

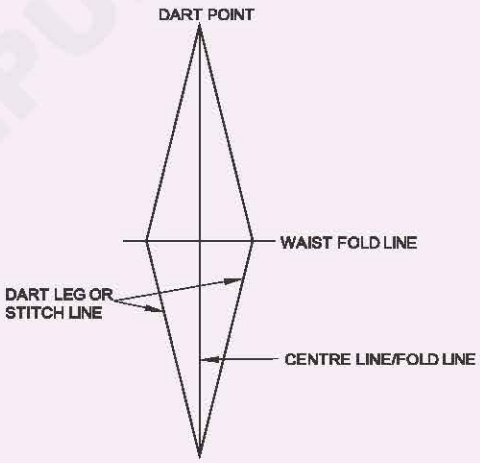


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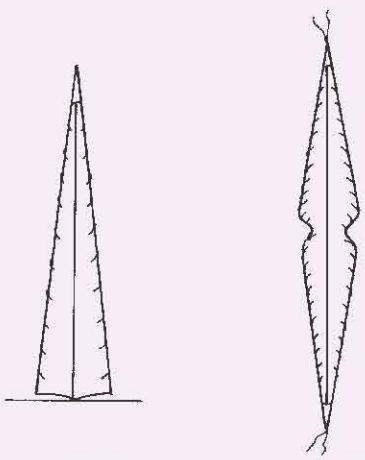
Fig 4

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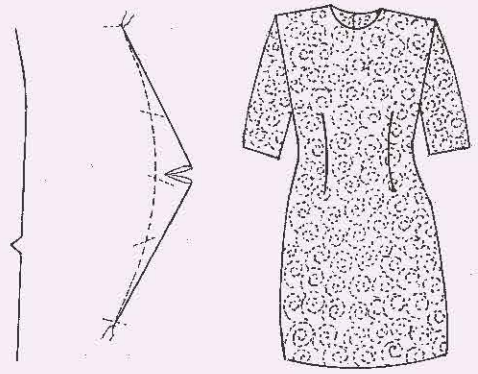
Well constructed darts appear on the right side as a seam. The seam should not bulge but taper gradually to point. Darts set better, if pressed over a round pressing pad on the wrong side.

The **contour dart** (variation of full dart) is used for semi-fitted and fitted styles of garments which don't have a waist seam. These darts have two pointed ends, one providing fullness at the bust, the other fullness at the hip. The wide central part of the dart shapes the fabric at the waist. Clipping of intake is done in the middle of the dart; it will relieve strain at the waist and other curved sections and allow the dart to lie smooth. (Fig 5)

Fig 5



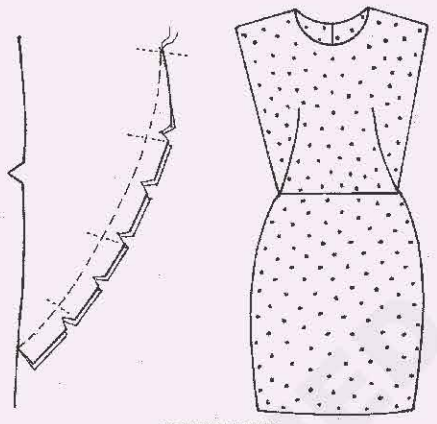
CONTOUR DART

DRN121615

The **French dart** (variation of half dart) gives a semi-fitted shape. It combines underarm bust dart and waist dart into one long dart running from the bust down at an angle towards the side seam. This dart is cut open on its center line before sewing so as to match the stitching lines. (Fig 6)

Before stitching, the darts have to be transferred from pattern to the fabric. Depending on the material two methods can be applied: tailor marks will be used on silk, polyester etc. and loosely woven material. On cotton marking with a **tracing wheel** is a fast method.

Fig 6

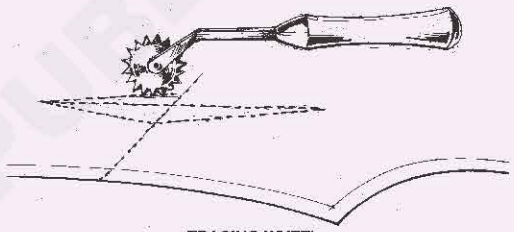


FRENCH DART

DRN121616

The tracing wheel is a pinned metal tool which is used to transfer pattern marks or construction lines on the lower layer of fabric or paper. (Fig 7)

Fig 7



TRACING WHEEL

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## Pleats

**Objectives:** At the end of this lesson you shall be able to

- **explain the basic construction features of pleats using the technical terms related to pleats**
- **explain the difference between knife pleats, box pleats and inverted pleats.**

**Pleats** are folds of fabric that are made to give decorative flare and fullness to a garment. They are commonly used on skirts and dresses, but also on sleeves or other components of a garment.

**Construction features of pleats:** Pleats are folded in vertical direction.

- Each pleat has an inner and outer fold. The outer fold line is placed on a placement line.
- The distance between inner and outer fold is called pleat depth.
- The pleat size consists of double the pleat depth.
- The distance between two neighboring outer folds is the pleat width (gap between the pleats).
- The width of material before pleating is called the pattern width.
- After pleating it is called the pleated section. The pleated section does not consider allowances for plackets etc. (Fig 1)

**There are three basic types of pleats**

**Knife pleats** are the most common form of pleats. The outer foldlines are all placed in one direction. (Fig 2)

While setting knife pleats there are three possible proportions among pleat depth and pleat width:

– pleat depth = pleat width g normal pleats

– pleat depth < pleat width g shallow pleats

– pleat depth > pleat width g overlapping pleats (Fig 3)

**Box pleats** are made by two single pleats in opposite direction. A full box pleat is folded under from two sides, so that the inner folds meet. It has two fold lines and two placement lines. (Fig 4)

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Fig 1

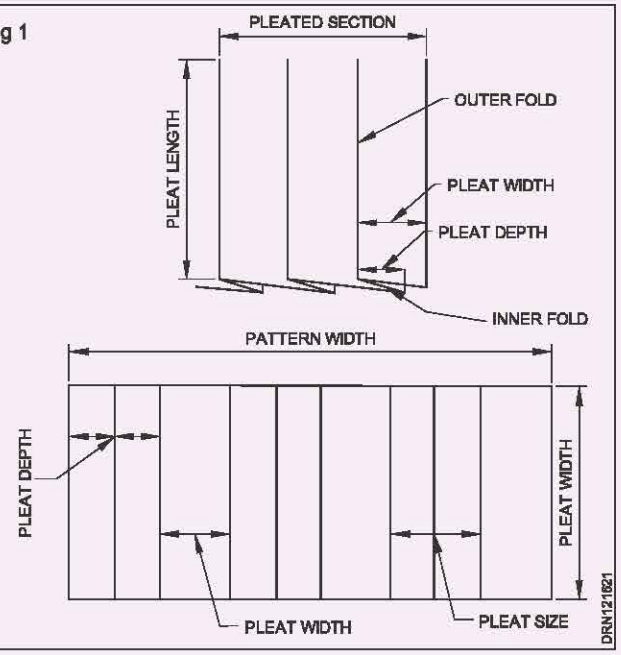



Fig 2

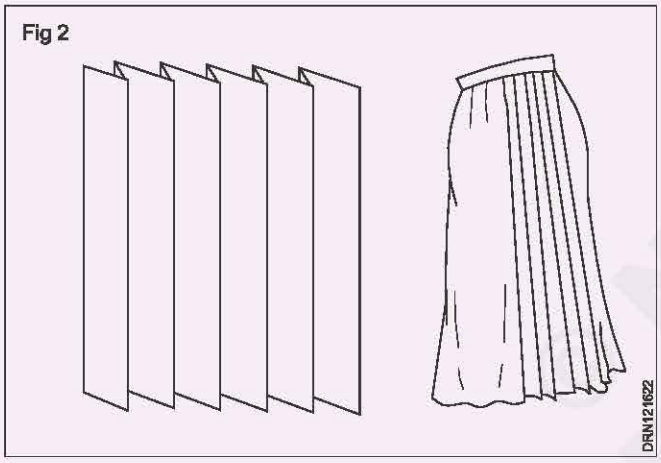
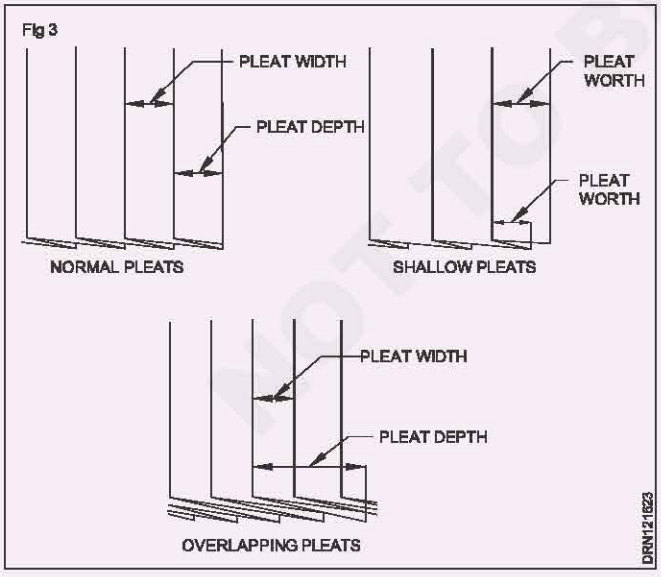



Fig 3




**Inverted pleats** are also made by two single pleats. They have two fold lines and a single common placement line. The two outer folds in the center of the pleat meet on right side. (Fig 5)

Fig 4

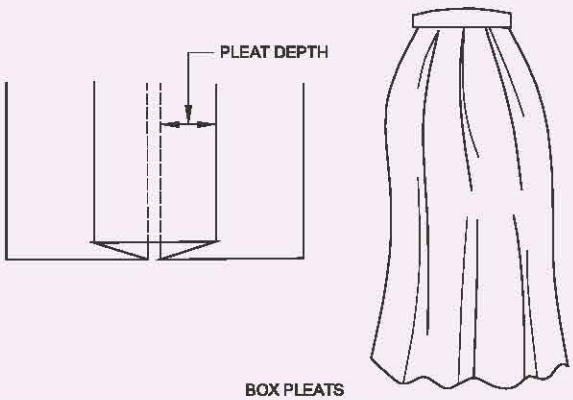
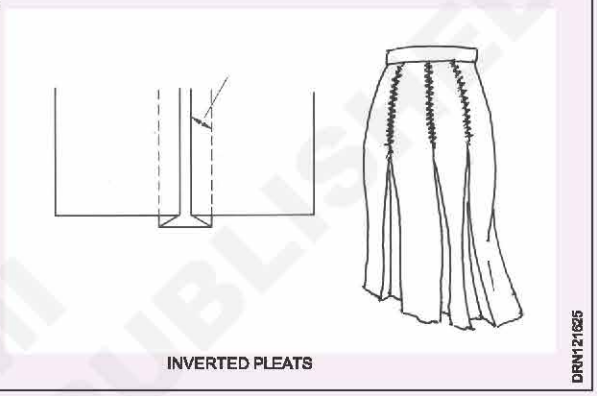



Fig 5




Pleats can be pressed crisply or can be left as unpressed to hang as soft folds. For pressed pleats, garment fabrics that crease easily are the most suitable. Pressing should be done with a pressing cloth.

If pleats shall be sharp, use steam or damp cloth to set the creases, then ensure that the pleats dry thoroughly before moving them. During construction of pleats they are pressed before basting stitches are removed.

To hold the pleats in position they can either be edge stitched or topstitched from the waist towards the hip. (Fig 6)

If pleats are formed on a checked fabric it must be taken care that repeats of check are consistent and that folds have appropriate depth to hang satisfactorily (not too deep and not too shallow).

Pleats on checked fabric can be set without drawing construction lines, since the lengthwise check lines can be used as such.

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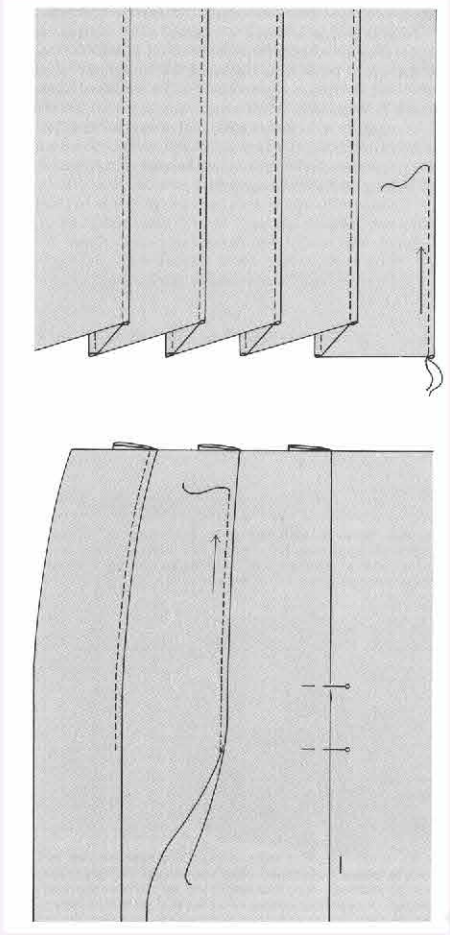
Fig 6



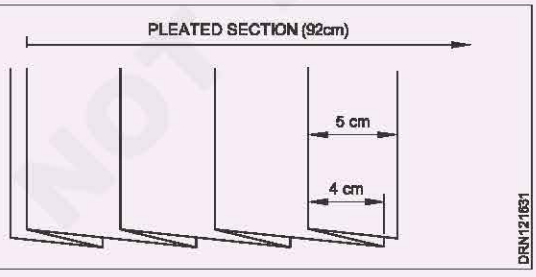
## Calculation: Material requirement for pleats

**Objectives:** At the end of this lesson you shall be able to
- **calculate the material requirements for knife pleats, box pleat and inverted pleats.**

### Knife pleats

**Example 1:** A pleated section should be of 92 cm width. The pleat depth should be 4 cm and the pleat width should be 5 cm.

Fig 1




a How many shallow pleats should be made?

b What should be the pattern width of the material strip for the pleated section?

c How much material (=length in cm) is required to make the pleated section, if the fabric is of width 90 cm, the length of pleat is 15 cm and 2 cm seam allowance per strip are necessary for each seam?

### Solution

a 92 cm : 5 cm = 18.4 (pleats) g 18 pleats

92 cm : 18 = 5.11..... = 5.1 cm (corrected pleat width)

**Explanation:** If the pleated section is divided by the pleat width, it gives the number of pleats.

If the number of pleats so got is not a whole number, it must be rounded off (can be rounded off to the next higher or to the next lower number, at free will). But then - as seen above - the pleat width as originally contemplated, has to be corrected by a fresh calculation.

b 4 cm x 2 = 8 cm (pleat size = material required per pleat)

8 cm x 18 = 144 cm (material required for all pleats size)

144 cm + 92 cm = 236 cm = 2.36 m (material required for all pleats size + width of pleated section)

**Explanation:** The material required for each pleat is (irrespective of the dimensions) twice the pleat depth. To the material required for all the pleats is added the width

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of pleated section ( = sum of all the pleat widths); (Ref. to Fig 3, Lesson 1)

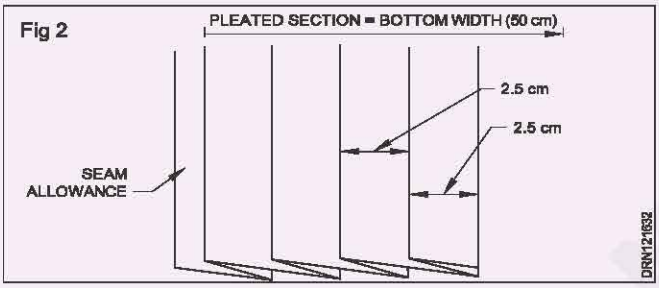
**The general rule:** pattern width for pleated components = 2 x pleat depth x number of pleats + width of pleated section

c 2.34 m : (0.90 m - 0.02 m) = 2.6... g 3 strips

15 cm x 3 = 45 cm

**Explanation:** If the pattern width is divided by the width of the material (less the seam allowances), one gets the number of material strips required. The number of strips, if fractional, is always rounded off to the next higher integer, as there can only be a whole number of strips and the material must suffice. In this and in the similar exercises that follow, the pleat lengths include all necessary material allowances.

**Example 2:** A baby frock is to have a pleat-set at the bottom. The width of the bottom circumference is 50 cm. The knife pleats (normal pleats) should have a depth of 2.5 cm. The seam allowance at the pleated section amounts to 1 cm each on the left and on the right. (Fig 2)




a How many normal pleats should be made?

b What should be the length of the strip of material for the pleated section?

**Solution**

a 50 cm : 2.5 cm = 20 (pleats)

b 50 cm x 3 = 150 cm (pattern width)

150 cm + 2 cm = 152 cm = 1.52 m

**Explanation:** Exercise (b) can be solved in accordance with the general rule derived from Example 1. In the case of normal knife pleats, however, there is a simpler procedure: The pattern width is always three times the pleated width, i.e. it is independent of pleat depth and pleat width (because of the triple layer of the material per pleat.

**Box pleats:** A box pleat consists of two normal knife pleats whose inner folds lie against each other. The pleat width is twice the pleat depth.

**Example:** A skirt has a box-pleat at the front. The pleated width of the skirt front at the hem should be 60 cm (when the pleat is flat). The pleat depth is to be 12 cm. What should be the pattern width of the front part of the skirt at the bottom (without seam allowance) (Fig 3)

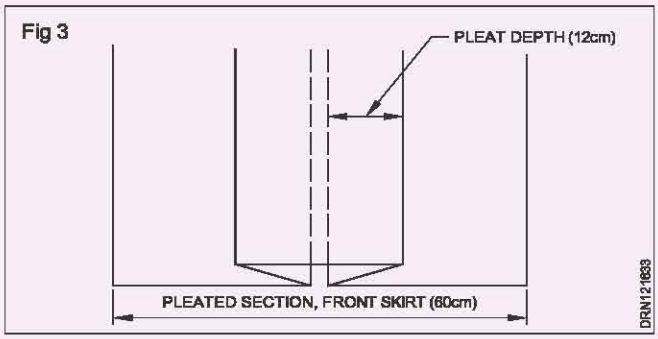
**Solution**

12 cm x 2 = 24 cm

24 cm x 2 = 48 cm

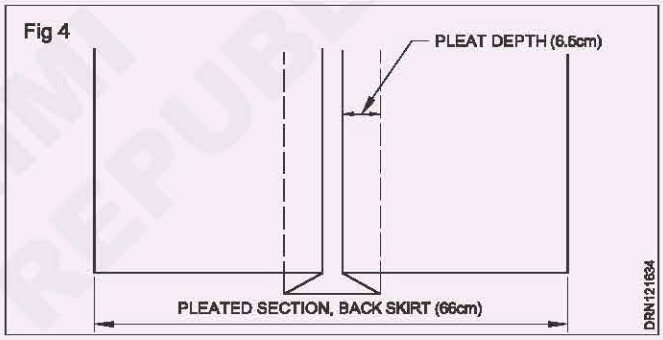
48 cm + 60 cm = 108 cm = 1.08 m

Pattern width should be 1.08 m.




**Inverted pleats:** An inverted pleat consists of two normal knife pleats whose outer folds lie against each other. The pleat width is twice as much as the pleat depth.

**Example:** For comfort, a dress is provided with an inverted pleat at the center back seam. The pleat depth should be 6.5 cm. The pleated section of the back portion at the bottom should be 66 cm (when the pleat is flat). What should be the pattern width of the back portion (without considering allowances) (Fig 4)




**Solution**

6.5 cm x 2 = 13 cm

13 cm x 2 = 26 cm

26 cm + 66 cm = 92 cm

The pattern width should be 92 cm.

**Exercises**

1 Prepare a paper model of
   - normal pleats (pleat depth 2 cm).
   - shallow pleats (pleat depth 2 cm/pleat width 3 cm)
   - overlapping pleats (pleat depth 4 cm/pleat width 1 cm)

2 Calculate the missing values (note: while calculating pleat depth, round off the final result to the next lower integer) (Table 1)

3 Calculate the quantity of material (fabric) required for pleated sections ("fabric allowance" in the last row refers to the requirement for seam allowance to join the strips) (Table 2)

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| | a | b | c |
|---|---|---|---|
| Pleat depth | 3 cm | 4.2 cm | 4 cm |
| Pleat width | 4 cm | - | 4 cm |
| No. of pleats | ? | 12 | ? |
| Pleated section | 80 cm | 62 cm | 48 cm |
| Pattern width | ? | ? | ? |

| | a | b | c | d | e |
|---|---|---|---|---|---|
| Pleat Depth | 3 | 4.5 | 3.5 | 4.2 | 2.5 |
| Pleat width | 3 | 5 | 3 | 4 | 4 |
| Pleated section | 168 | 260 | 144 | 172.2 | 124 |
| Pleat length | 22 | 12 | 10 | 48 | 18.5 |
| Width of material | 105 | 90 | 122 | 148 | 130 |
| Seam allowance per strip | 1.5 | 2 | 3 | 2.5 | 2 |

4 A pleated section of normal pleats has to be made. The pleated section should be 189 cm and the pleat length 15 cm. The material available has a width of 114 cm. A seam allowance of 2.5 cm per strip is required to join the strips. What is the total material requirement?

5 A pleated section should have a width of 15.5 cm. 5 normal pleats are to be set.

a Calculate the pleat depth.

b What should be the pattern width of the material strip for the pleated section?

6 A pattern width of 144.5 cm is available to make a pleated section. What can be the maximum width of the pleated section, if the pleat width should be 3.5 cm and the pleat depth should be 2.5 cm?

7 A strip of material of 120 cm width is made into 8 normal pleats with a pleat depth of 4 cm. What will be the width of the pleated section?

8 A pleated section consisting of normal pleats has a width of 95 cm, the pleat width being 5 cm, what should be the pattern width (ignoring the seam allowances)?

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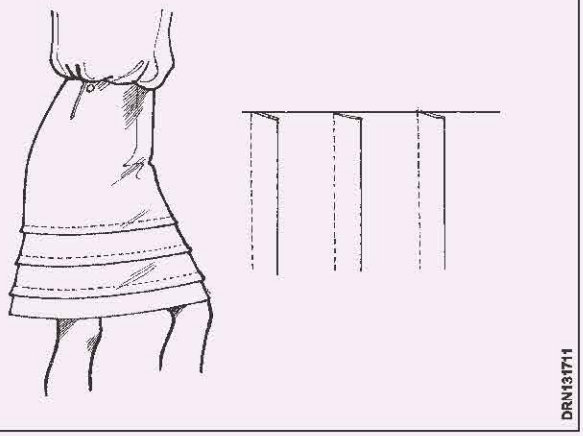
# Tucks

**Objectives:** At the end of this lesson you shall be able to
- **name the function of tucks**
- **name the types of tucks and their features**
- **explain the construction techniques and stitching aids.**
- **explain the material required for stitching tucks.**

A tuck is a straight fold of fabric stitched on the grain evenly throughout the fold. (Fig 1)

Fig 1




It may appear similar to the pleat but some construction features are different. Tucks are stitched to the full length, whereas pleats are stitched on the top in the horizontal direction or only for a short length in vertical direction.

A tuck also has a fold line and a placement line and is stitched parallel to the foldline on its full length. A tuck is constructed similar to the knife pleat, i.e. in one direction (except the cross tucks). The beauty of a tuck depends on it accuracy. It will look good only if the width of tuck and the distance between the tucks are maintained evenly. The tuck width and the spacing between the tucks depends on the desired design effect and the thickness of the fabric. Special design effects can be achieved by setting the tucks groupwise.

Tucks are used mainly for decorative purpose. In some cases they are used for shaping the garment to the body (similar function as the dart) or used in children´s dresses to provide some allowance for growth. In some rare cases tucks are used to conceal joints in a garment when they are altered. The joint will appear on the wrong side of the garment while the decorative tuck will be visible from the right side.

Generally tucks are folded on the right side of the garment since they have decorative purpose. Only dart tucks used for shaping are folded on the wrong side for shaping.

**Types of tucks:**

There are types of tucks -

1 Pin tucks - When the fold is very narrow, they are called Pin Tucks.

2 Spaced tucks -Spaced tucks are folds of cloth sewn at regular intervals.

3 Blind Tucks - Blind tucks are sewn so close together that the rows of stitching do not show on the outside. Each tuck overlaps the next covering, the previous row of stitching.

4 Shell Tucks - Narrow tuck with shell like scallop edge is called scallop tucks.

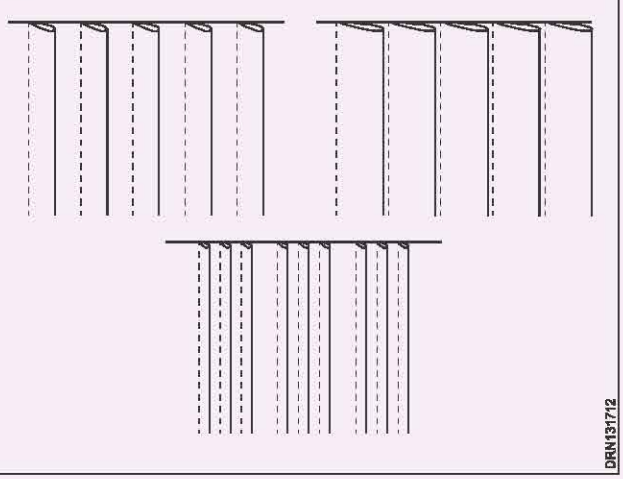
5 Corded Tuck - When a cord is placed inside the fold, is called corded tuck.

6 Released Tuck - When tuck stitching started from a point and end somewhere in middle called released tuck. This is to control small amount of fullness.

**Tuck is a fold or pleat in fabric that is sewn in place.**

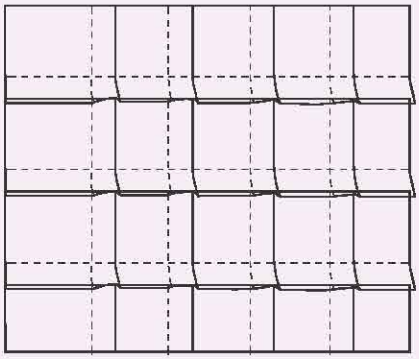
**Plain tucks** are formed in one direction. Width of tucks and the spacing can vary with the desired effect. If the space given between the tucks is equal to the depth of tuck, i.e. the fold of the tuck touches the stitching line of the previous one, they are called blind tucks. **Blind tucks** can be regarded as a variation of plain tucks. Another variation of plain tucks are the **pin tucks.** As the name implies they are of very narrow width, almost equal to a pinhead. Only thin fabrics are suitable for pin tucks. (Fig 2)

Fig 2




**Cross tucks** are stitched in both directions, vertical and horizontal. The lengthwise tucks are stitched first, then pressed in one direction before the widthwise tucks are stitched. (Fig 3)

Fig 3



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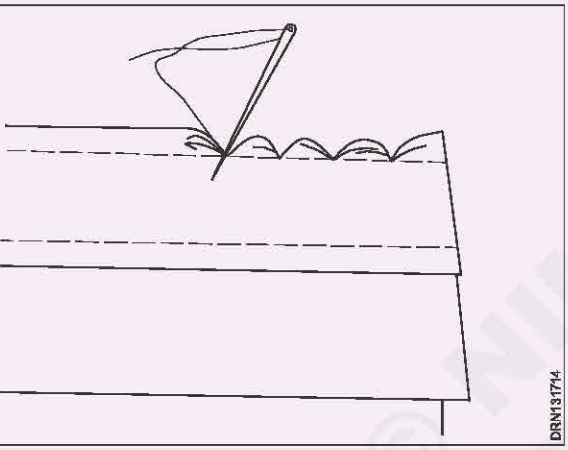
A tuck can be given a special decorative effect by making it into a **shell tuck.** This tuck has a scalloped edge. They can be formed on single edge or as multiple rows. Thin and medium weight fabrics are best suited for that purpose. (Fig 4)

Fig 4



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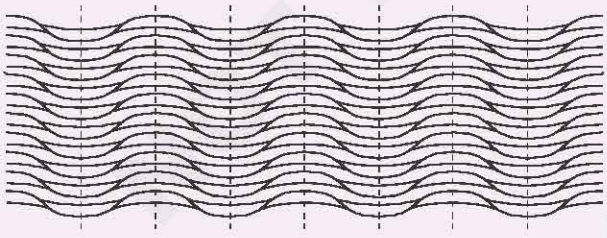
A group of blind tucks can be made to show a **scalloped effect.** For that purpose the fold of tucks should be a little wider. The tucks are top stitched perpendicular to the tucks first in one direction, then their folds are placed in the opposite direction to be top stitched again perpendicular to the tucks. This process is repeated on the full length of tucks at regular intervals. Thin and medium weight fabrics are best suited for shell tucks and scalloped tucks. (Fig 5)

Fig 5



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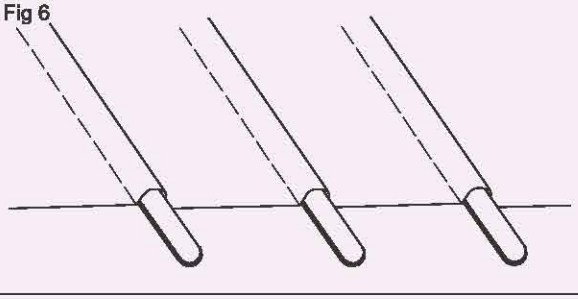
**Corded tucks** are made by placing a cord inside the fold. This makes the tuck more prominent. A zipper foot is required for stitching this type of tuck. (Fig 6)

**When tucks are used as a symmetrical element of decoration on the garment, the fold lines of either side should either face centre front or they should be directed away from the centre.**

Fig 6



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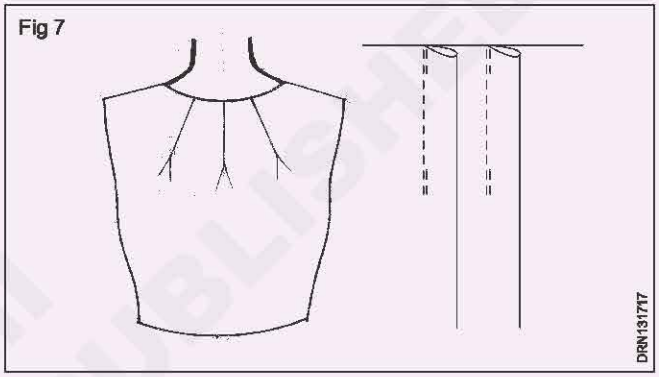
**Dart tucks** are used for shaping the garment. They can be formed on shoulder line, front and back waistline of the bodice and the front and back section of the lower garment. They are used to provide fullness and are usually formed on the wrong side of the garment. In rare cases they are formed on right side for decorative effect. (Fig 7)

Fig 7



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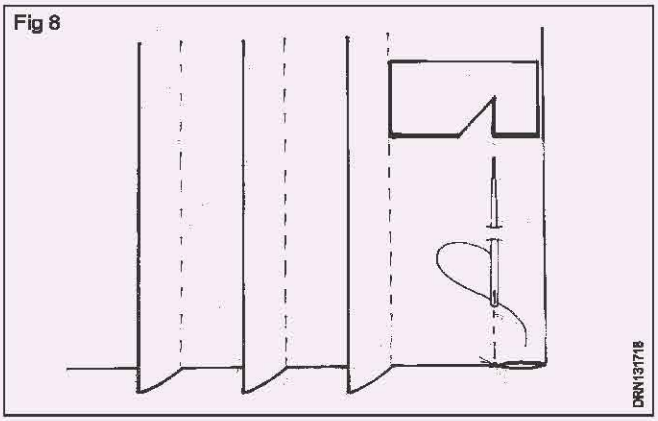
The difference between darts and dart tucks can be described as follows:

- Dart tucks are of less width (approx. 0.5 cm).
- To achieve the desired shape they are stitched in groups of 3 or 4.
- Dart tucks are of equal width on the full length while darts taper towards the end.

While stitching tucks some tools are useful:

A gauge made from cardboard helps stitching without marking the stitching lines. The length of gauge includes the width of tuck and the space between the tucks. The notch indicates the width of tuck. If the gauge is placed with the left edge on the stitching line of the previous tuck and the right edge is on the fold of the new tuck the notch will indicate the position of the stitching line for the new tuck. (Fig 8)

Fig 8



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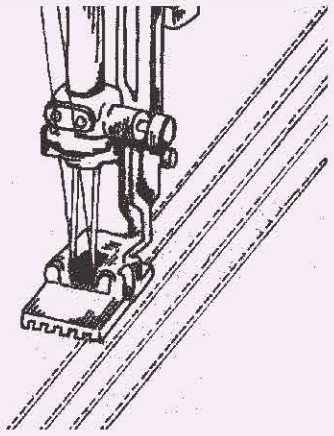
**Tucker foot** is a time saving device for making tucks up to 2.5 cm in width. It is an extra attachment inserted in place of the presser foot for treadle and motorised sewing machine. It helps to achieve an equal width of tucks and equal spacing between the tucks in one operation. The tucker foot is provided with two scales numbered from 0 to 8. The smaller scale near the needle will help to get a uniform width of tuck. The required width of tuck is set by moving a sliding plate with the help of a screw. While stitching, the fabric is guided between the two scales.

There is another screw near the needle to regulate the space between the tucks. Set the tuck scale first for the width of tuck, then the space scale is adjusted to a required space. The tucker foot does two operations at a time: it maintains the tuck width and the distance between the tucks even. (Fig 9)

Fig 9



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An edge stitcher is a special presser foot which is inserted in the machine in place of the normal presser foot. It is useful as a guide for stitching pin tucks, tucks with lace, piped seams and for self enclosed seams (e.g. french seam). It has a series of slotted guides where the folded fabric is inserted. The slots are of different widths for different edge stitch distance. (Fig 10)

Tucks can be formed before or after the respective component of the garment is cut from the fabric.

The easier way is to fold the tucks before layout. The disadvantage with this method is that the edges have to be recut. It also increases the wastage of fabric. (Fig 11)

With the other method the pattern is slashed and spread. This provides the extra space for folding the tucks after the component is cut. (Fig 12)

Fig 10

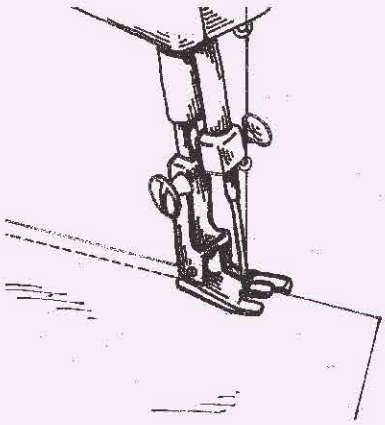

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Fig 11

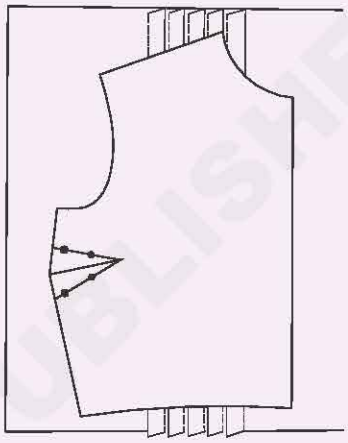

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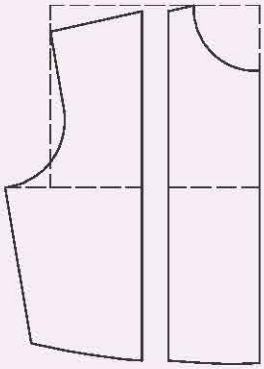
Fig 12



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## Calculation : Material requirement for tucks

**Objective:** At the end of this lesson you shall be able to

- **calculate the material requirement for stitching tucks.**

The following terms and measurements are important for the calculation of tucks:

**Example 1:** A tucked component shall be of 39 cm tucked width while the gap between the tucks is of 1.2 cm. How many tucks are to be stitched, if the first and the last tuck is 1.5 cm away from the edge?

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**Solution**

39 cm – (2 x 1.5 cm) = 36 cm (distance between the first and the last tuck)

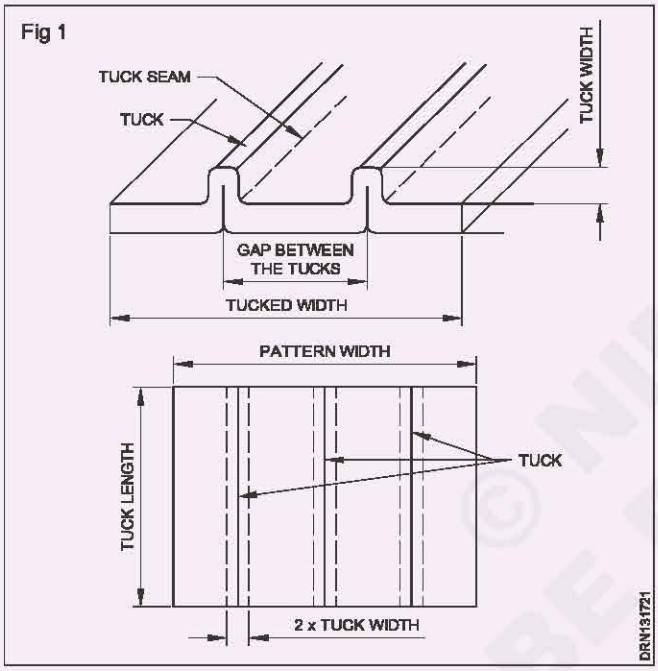
36 cm : 1.2 cm = 30 (gaps)

30 (gaps) + 1 = 31 (tucks)

**The fundamentals for the calculation of tucks are similar to those for the calculation of buttons.**

**Example 2:** A tucked component of 28 cm tucked width shall be prepared. There shall be a gap of 1.5 cm between the tucks and the tucks shall be of 2 mm width. The first and the last tuck shall be 2 cm away from the edges. What is to be the pattern width for the respective tucked component?

Fig 1




**Solution**

2 mm x 2 = 4 mm (material requirements for each tuck)

28 cm – (2 x 2 cm) = 24 cm (distance between the first and the last tuck)

24 cm : 1.7 cm = 14.1 ... (gaps) 15 gaps

15 (gaps) + 1 = 16 (tucks)

4 mm x 16 = 64 mm = 6.4 cm (for all tucks)

28 cm + 6.4 cm = 34.4 cm (pattern width)

24 cm : 15 = 1.6 cm (corrected gap between the tucks)

**Explanation:** If the number of gaps between the tucks so got is not a whole number, it must be rounded off (can be rounded off to the next higher or to the next lower number). But then – as seen above – the gap between the tucks as originally contemplated, has to be corrected by a fresh calculation.

## Exercises

1 Calculate the number of tucks:

| | Tucked width | Gap between the tucks | Distance of outer tucks from the edge |
|---|---|---|---|
| a | 44 cm | 2 cm | 2 cm |
| b | 24 cm | 1.5 cm | 1.5 cm |

2 Calculate the missing values.

| | Tucked width | No. of tucks | Gap between the tucks | Tuck width | Distance between tuck and left edge | Distance between tuck and right edge | Pattern width |
|---|---|---|---|---|---|---|---|
| a | 30 cm | ? | 3 cm | 1 mm | 1.5 cm | 1.5 cm | ? |
| b | 42.5 cm | ? | 1.5 cm | 1.5 mm | 2 cm | 3 cm | ? |
| c | 28 cm | ? | 1.5 cm | 1.2 mm | 3 cm | 3 cm | ? |

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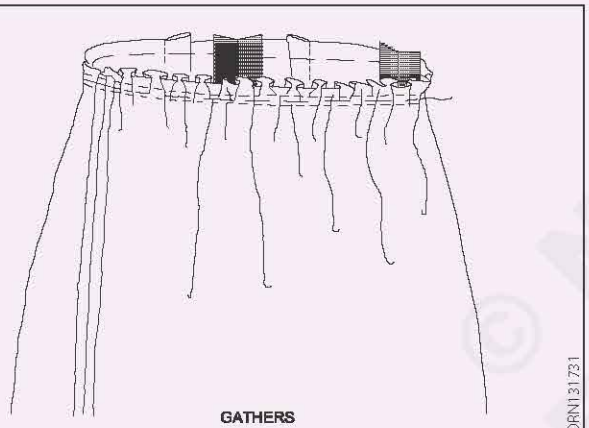
## Gathers and Shirrings

**Objectives:** At the end of this lesson you shall be able to
- **state the features of gathers**
- **explain the importance of shirring.**

### Gathers

Gathers are more popular method for controlling fullness in a garment. Gathering is one or two rows of stitching drawn up to form very tiny pleats in the fabric. It is important that the fullness must distributed evenly through out the entire area. If the fabric is very wide for gathering, work the gathering stitches in batches to prevent the thread snapping as it is pulled up. The gathered section of a piece of fabric often looks completely different from the actual fabric. Fabric is usually gathered to one-half (½) to one-third (1/3) the original width. The effect of gather may be soft and drape, or crisp and billowy depending on the fabric. Gathers is done after construction seam have been stitched, seam finished and pressed. Gathering most often occurs in a garment at waist line, cuffs, yokes and children clothes etc.

Fig 1



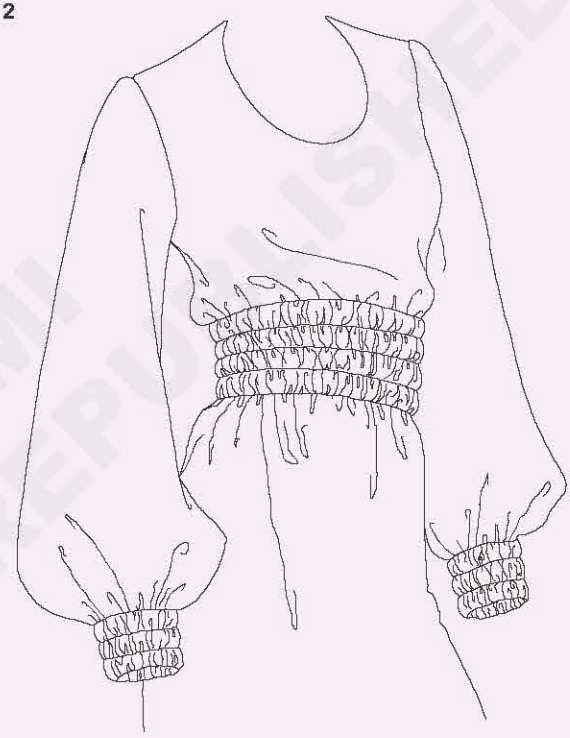
GATHERS

DRN131731

### Shirring

Shirring is the most popular method of controlling fullness in a garment. Gathering is one or two rows of stitching drawn up to form very tiny pleats in the fabric, but shirring is more than three rows of gathers. In shirring the fullness is distributed evenly throught the entire area. It is primarily a decorative way of controlling fullness. Shirring by machine is the easiest and quickest method than by hand. Shirring is formed with multiple row of gathering. Light weight fabric are most appropriate for shirring; they may be either crisp or soft voiles, crepes and jerseys are excellent choicer. Non iron fabrics are good because it is difficult to press shirring without flattening. Rows of shirring must be straight, parallel and equidistant. Pressing done with tip of iron directly into the fullness.

Fig 2



SHIRRED MIDRIFF AND CUFFS DRAMATIZE A PLAIN DRESS

DRN131732

## Frills and Ruffles

**Objectives:** At the end of this lesson you shall be able to
- **explain frills and ruffles.**

Frills are used for the purpose of decorating a garment. They can be used on hem lines, necklines and at any portion of the garment as per taste. The width of the frill may 1" to 3" and length should be cut as per the required amount of gathering. The length side should be cut along the warp way of the fabric. The gathered edge of the frill can be concealed in a seam. Frills can be constructed in a double layers and in circular shape. If the width of the frills are more than required then they are called as "Flounces".

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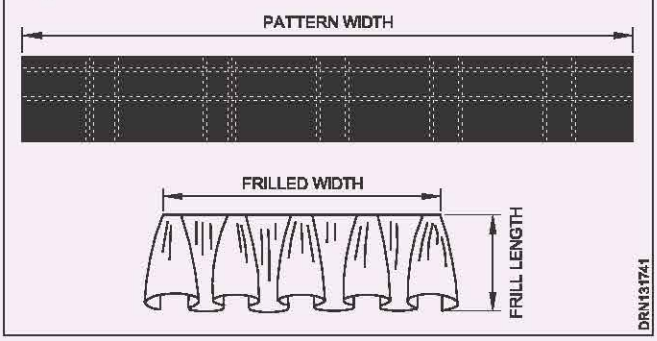
# Calculation: Material requirements for frills

**Objective:** At the end of this lesson you shall be able to
- **calculate the material required for frills of different length and width.**

Terms and measurements which are important for the calculation of frills can be seen from the graphic:

Fig 1




***Example:*** A frill of 1.80 m/1 m frilled width is required. The pattern width shall be frilled to 1/3 of its length.

a What is the measurement of the pattern width (length of the strip of material for the frill)?

b What is the material requirement under the following conditions?

Width of fabric : 1.10 m

Length of frill : 12 cm

Additional material for hem and allowance to join the frill to the garment: 3 cm

**Solution**

a 1.80 x 3 = 5.40 m

b 12 cm + 3 cm = 15 cm
5.40 m : 1.10 = 4.9 (5 strips)
15 cm x 5 = 75 cm

**Since the number of strips is got only by rounding off to a full (whole) number the balance material generally is sufficient for the seam allowances which are required for joining the strips. If the number of strips is calculated as a full (whole) number or close to a whole number an additional strips would have to be calculated for the seam allowances.**

In practice some material is saved while the material is frilled with less density. This is the reason why seam allowances for joining the strips are not calculated separately in the example above and also in the following exercises.

**Exercises**

1 Calculate the material requirements for frilled components („seam allowance" in the last column is meant for the hem of frill and for joining the frill to the garment).

| | Pattern width | Width of fabric | Length of frill | Fabric allowance |
|---|---|---|---|---|
| a | 440 cm | 0.98 m | 12.5 cm | 2.5 cm |
| b | 210 cm | 1.20 m | 8 cm | 3 cm |

2 A pattern width of 9.40 m is required for a frilled component. The width of fabric is 1.19 m. The length of frill shall be 7.5 cm; 2 cm are required for hem and joining the frill to the garment. How many cm of fabric are required for the frilled component?

3 A frill shall be attached to the hem of a skirt. For this a frilled component of 1.60 m frilled width is required. The pattern width is reduced to 2/5 of its length. What is the length of the strip of material?

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## Types of hand stitches and their use

**Objectives:** At the end of this lesson you shall be able to
- **name and classify hand stitches**
- **describe their use.**

Basic stitches are divided into constructive and decorative stitches which are used in embroidery. Constructive stitches are further divided into temporary and permanent stitches.

**Temporary stitches:** Basting or tacking is a temporary stitch used for holding two or more layers of materials together before the permanent stitches are made. Usually this stitch is horizontal and is worked from right to left. This is the only stitch, which is started with a knot. For basting use a contrasting colour thread so that it can be easily seen and removed. The length of the stitch will vary depending on the weight of the fabric and how securely the pieces are to be held together. To end basting make two stitches, one on the top of another. There are several types of basting stitches.

**Even basting** is used for short length of seams and folds.

**Uneven basting** is used for long length of seams and folds.

**Diagonal basting** is used when several layers of fabric are to be held securely.

**Padding stitch** is used in coats to hold the lining and inner lining.

**Tailor's tacks –** Thread marks are basically uneven basting stitches. They are used to transfer marks on a lower layer of fabric.

**Permanent stitches:** In permanent stitches avoid using knots, while starting and ending the stitches. Begin with a small back stitch if it can be concealed under the permanent stitches or leave a short length of thread (about 2 to 3cm) extending on the wrong side which can be caught and held under the first few permanent stitches. To end the stitch take the thread to the wrong side and secure with loops.

**Running stitch** is the simplest of all the hand stitches, used for sewing hand made seams, tucks, gathering, quilting and mending.

**Back stitch** is strong and sometimes substituted for machine stitching.

**Pick Stitch** (Half back stitch) is used on fine materials.

**Overcasting** is used on raw edges, either single or double to prevent them from fraying.

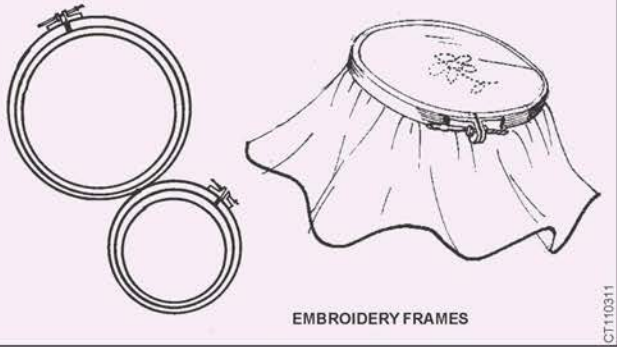
**Hemming** is used to secure a folded edge of material. Its most common use is for hems. Hemming appears as small, slanting stitches on the wrong side and sometimes on right side. These stitches should be fine and spaced close enough to hold the hem securely in place. Before starting the hem, fasten the thread with several tiny stitches on top of each other. Finish the hemming with several stitches to fasten it securely. Don't use too long thread for stitching. The maximum length should not exceed 70 cm to avoid knots in thread, it also helps to avoid accident with the needle while pulling the thread.

## Embroidery accessories/embroidery stitches

**Objectives:** At the end of this exercise you shall be able to
- **name embroidery accessories and their features.**
- **explain the application of the main stitches.**

**Tools for embroidery work:** Embroidery **frame** is usually in circular shape. It consists of two rings, one inner and one outer. The fabric is placed in between the rings (Fig 1) and kept in tight position with the help of an adjustable screw on the outer ring (Fig 2). The frame helps to keep the fabric in an uniformly stretched position. This maintains uniform tension of the embroidery work.

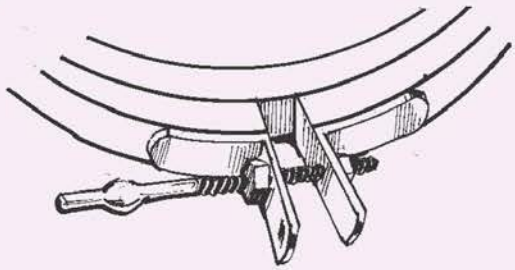
Fig 1



EMBROIDERY FRAMES

CT110311

Fig 2

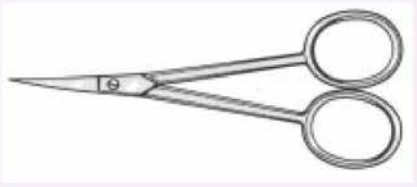


CT110312

Round frames are available in 10 to 25 cm diameters. The larger sizes are generally made with clamps for attaching it to a table with a screw for adjusting.

Sharp pointed embroidery scissors are essential. The handles are longer. They have narrow and pointed blades. They are used for cutting fine and short threads. (Fig 3)

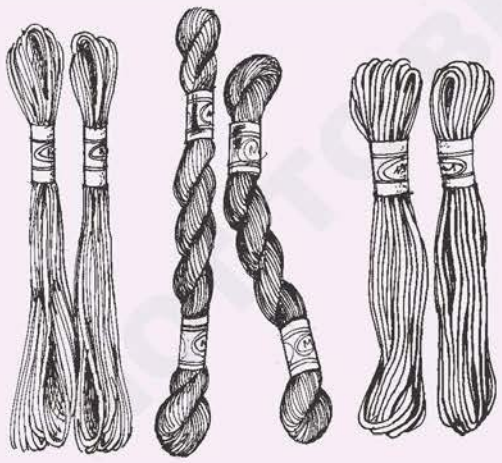
Fig 3



CT110313

Embroidery **threads** are comparatively thicker than fabric threads. The best threads have a fairly smooth texture, which enhances the crisp character of the embroidery. Stranded cotton is lustrous thread made of six strands easy to separate. A single strand can be used for fine work and several strands for bolder effects. The threads are available in hundreds of colours. Pearl cotton thread is short with two plies, which are twisted to produce a beaded or pearl effect. Soft embroidery cotton thread is a thick thread, used on coarse fabric. Silk threads give a luxurious quality to the stitching, but are more expensive than the cotton threads. (Fig 4)

Fig 4




CT110314

Embroidery needles have large eyes, to allow the stranded threads to pass through. They are shaped with pointed and round tips and the sizes are denoted by numbers from 14 to 24. (Fig 5)

Fig 5

CT110315

**Transferring the design:** After selecting the design for the embroidery work, the markings for the design should be transferred to the right side of the material without spoiling it. There are several ways of doing this besides the method shown in practical lessons. Some of them are Direct Method, Tacking Method, Transfer by Ironing.

**Direct method:** Fabric such as organdy, nylon, muslin, nylex, voil, etc., can be laid over the design and traced directly with pencil.

**Tacking method:** This method is used on velvet, dark coloured cloth materials and all knitted fabrics. This method is worked by tracing the design on a thin tissue paper and tacking the design with the fabric by fine running stitch and then tearing the rest of the paper.

**Transfer by ironing:** Readymade paper pattern can be transferred onto the material by ironing. The transfer has the design outline in wax or ink on thin paper. The printed design is laid onto the material and moderately hot iron is applied to the back of the transfer. When the paper is removed, it is found that the design is transferred onto the material.

**Embroidery stitches:** Besides weaving and printing techniques, embroidery work gives an ornamental look to the fabric. There are different kinds of embroidery stitches, which are known by special names. For successful embroidery work, it is essential that you learn to work the basic stitches. In addition, you should acquire the ability to choose the right kind of stitches, designs and colour combinations suited to the type of fabric and for the purpose and use of garment or article, on which the embroidery is to be made. The stitches must be sufficiently taut, so as not to make loops and yet loose enough not to pucker the material. While beginning embroidery, the design must be outlined first. The outlining must always be done correctly or otherwise the design would loose its shape.

There are different kinds of embroidery stitches, for example;

**Stem stitch** is often used. It is one of the simplest stitches. It is worked on the traced line. It is a line stitch used for outlining designs, especially stems and leaves.

It can also be used for filling small designs by working several lines side by side.

**Blanket stitch** is used as a decorative edging for blankets and other articles or as part of a design for which the blanket stitch makes up the border.

**Closed blanket stitch** is used mainly for scallop. The beauty of a scallop lies in the regularity of the stitches, which must be as close together as possible.

**Buttonhole stitch** is similar to blanket stitch. The difference is the stitches are close together and are of same height.

**Fishbone stitch** is used for large motifs. It is made by gathering the cloth slightly with the stitches.

The working of **straight feather stitch** is similar to that of blanket stitch, but the stitches slant towards a centerline from either side. You can make **double or triple feather stitch** by making two or three slanting on one side and then a similar number on the other side. It is used for border patterns.

**Chain stitch** is used for filling. It can be done side by side to fill large shapes or to work single lines. The result of this stitch is a loop, which will then form a link. The link can be of varied lengths, shorter the prettier.

**Hem stitch** is used as a decorative stitch on borders. Different designs can be created by working either single or double hem. Suitable fabric for this type of stitch is linen of even weave.

**Lazy daisy stitch** is done in the same way as chain stitch, the only difference being that the loop is held by a stitch taken across the end. It can be used to portray flowers and leaves.

**Herring bone stitch** is used as a decorative stitch as well as for finishing hems and raw edges of seams. On the wrong side, two rows of running stitches are seen. When worked closely on the wrong side, this stitch can be used to do shadow work.

**Cross stitch** is composed of two slanting stitches which cross in the middle. This stitch does not require any great experience. The beauty of the work depends mainly on regularity and the good choice of colour. Choose a fairly thick material in which the thread can be counted or used as a temporary canvas. It is commonly used for filling of a third design,

**Satin stitch** is used for solid embroidery. It is worked on a design with filling or padding. Satin stitch make the embroidery stand out and gives it a richer effect.

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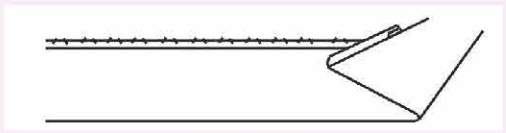
# Hems

**Objectives:** At the end of this lesson you shall be able to
- **explain about hems and types of hems.**

A hem is a finish for any bottom edge of a garment. There are three basic forms - a turned up edge (the most common), a faced edge and an enclosed edge. Although all are dealt with here as hem treatments any of them might be used for other edges as well.

Fig 1

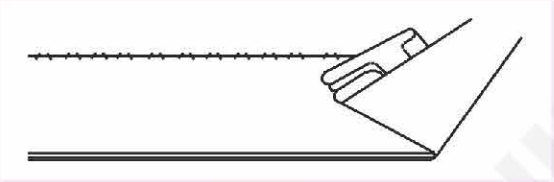


TURNED-UP HEM

DRN131911

Selection of a hemming method depends largely on garment style and fabric. Whatever the choice, certain criterias should always be met:

Fig 2



FACED HEM

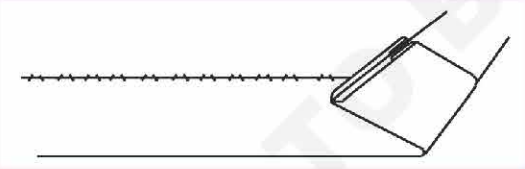
DRN131912

1 The garment should hang evenly and gracefully.

2 There should be no lumpiness in the hem allowance.

3 Unless meant to be decorative, finished hems should be totally inconspicuous.

Fig 3



ENCLOSED HEM EDGE

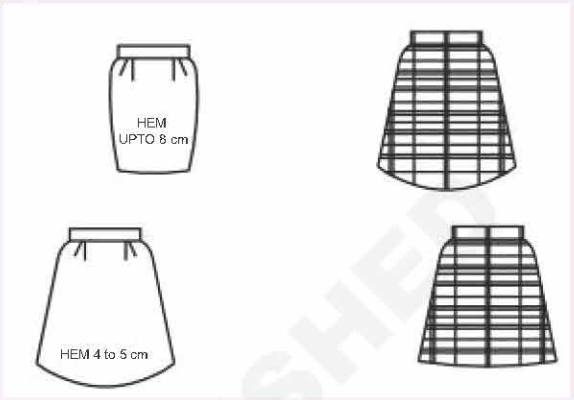
DRN131913

### Turning up the hem edge

In a turned-up hem, a certain width of fabric, the hem allowance, is folded inside the garment, then secured by hand, machine or fusing. This is the hem type usually provided for in pattern designs, with the amount of turn-up indicated on the pattern by a line or written instructions. It is wise to check this allowance before cutting out te garment, should a change be desirable.

The hem's shape, straight or curved, generally determines how much should be turned up. As a rule, the straighter the edge, the deeper the hem allowance; the more it curves, the shallower the allowance. Exceptions are sheer fabrics, in which a very deep or a narrow rolled hem may be preferable and soft knits. Where a narrow turn-up will minimise sagging.

Fig 4




DRN131914

Hem allowance varies according to garment shape up to 8 cm is usually allowed for a straight garment 4 to 5 cm for a flared one. Fabric weight should also be considered.

A hem line may look distorted if the hem curve is too extreme for, or does not align with, the fabric design. A slight adjustment may be necessary, for a better effect.

### Sewing hem by hand

Before a hem is secured by hand, the raw edge should be neatly finished. The finish chosen depends first on fabric characteristics and garment style, second on personal preference. The edge can be left uncovered on fabric that does not fray, also where a lining will cover the hem; use a covered edge for fabric that frays a great deal, and in those situations where a more finished look is wanted.

There are two basic hand hemming methods - flat where stitches pass over the hem edge to the garment and blind where the stitches are taken inside between hem and garment. Blind hems are best for heavier fabrics and knits because the hem edge is not pressed into the garment.

### Sewing a hem by machine

The major assets of machine hems are speed and extra sturdiness. They can also provide a decorative touch and are especially appropriate if top stitching is part of the design machine stitches are more apparent on a hem than hand stitches. Of the several methods, the blind stitched hem is the least conspicuous because only about every sixth stitch catches the right side of the fabric. For blind stitching a hem on a knit or on fabric that does not fray. For fabric that frays, see the method below.

Use machine hems only on garments where easily seen stitches do not detract from the overall appearance. Take special care with all types of machine stitched hems to keep stitching on even distance from the hem line.

### Faced hems

In a faced hem most of the hem allowance is eliminated; a band of light weight fabric is then stitched to the hem and turned inside so it does not show. There are two basic facing forms - shaped (cut with grain lines and shape conforming to the hem) and bias (cut as a bias strip, then shaped to fit). You can buy bias hem facing ready made in various colours.

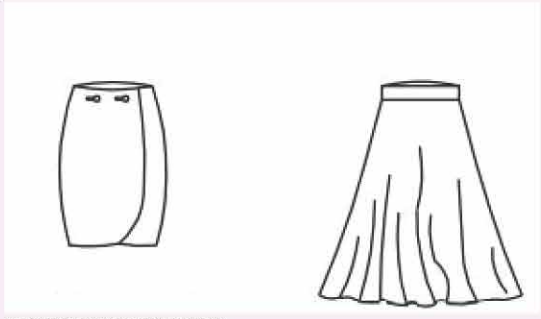
A shaped facing is applied as a rule, where a hem shape is unusual, as in the wrap skirt, right. Its use is limited to a hem with minimal flare.

A bias hem facing is ideal for a widely flared hem, especially when the garment itself is cut on the bias. It is recommended in place of a turned-up hem when (1) there is not enough hem allowance to turn up; (2) the fabric is exceptionally bulky; (3) a skirt is circular in style.

### Banding

Banding is an extension of a garment edge. It can be cut the same shape as the edge or on the bias. The latter is the usual approach for a hem as it is ideal for adding length.

Fig 5



SHAPED FACING FOR HEMS WITH UNUSUAL SHAPES

BIAS FACING FOR WIDELY FLARED SKIRTS

DRM131945

To prepare the hem for banding mark the hem line at the desired length measure up from the hem line a distance equal to finished banding width; mark a new line and trim all but 6 mm of fabric below it.

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# Corners

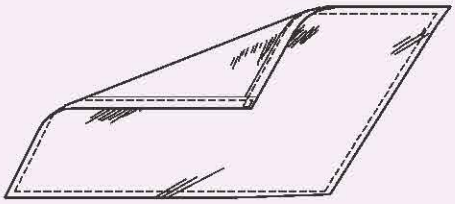
**Objective:** At the end of this lesson you shall be able to
- **describe the types of corners and their features.**

Corners are formed where two edges meet. The meeting place of corners has more layers. They are finished in different methods.

**Overlapping corners** are slightly bulky, therefore constructed in light weight fabrics used for napkins, table cloths, towels, handkerchiefs, bed covers etc. and also on the hem of dresses with full open front.

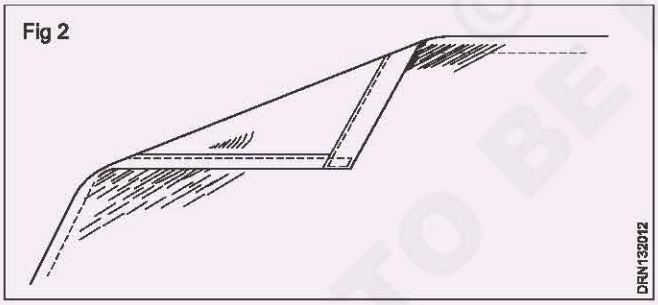
**Variations of overlapping corners:** When the hems on both the edges (lengthwise and widthwise hem) have folds of equal size, we get a **square corner**. Reducing bulk at the corners of a heavy fabric, can be made by cutting away a rectangular piece on the underlay. (Fig 1)

Fig 1




If one hem width is wider than the other side, then the finished corner will form a small rectangle. (Fig 2)

Fig 2




The diagonal joining of two edges at the corner is called **mitring**. The joint may be stitched or folded in place. Only an accurate folding will help you to get a good mitring. To reduce the bulk of the material on the under side, the joint is cut diagonally and pressed open. **Mitred corners** can be finished in two directions, when the mitred piece goes around the corner, it is an outward corner (used in table cloth, pillow cover, bed cover, etc.). If the piece lies within the corner then it is an inward corner (used in neck line) (Fig 3)

**Variations of a mitred corner:** Self-turned-up corners are worked mainly on the wrong side of the material. The main material is turned to the wrong side and folded in place; This type of corner always forms an outward corner. (Fig 4)

Fig 3

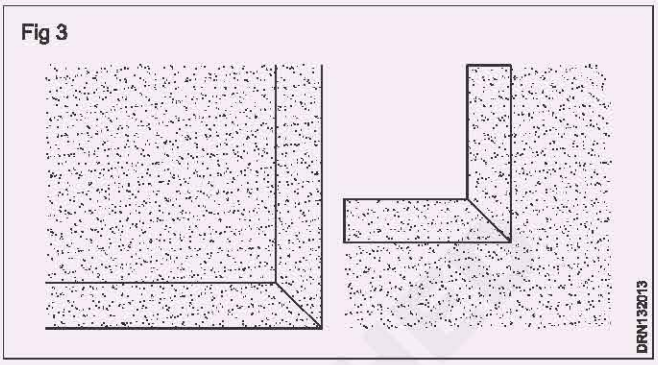
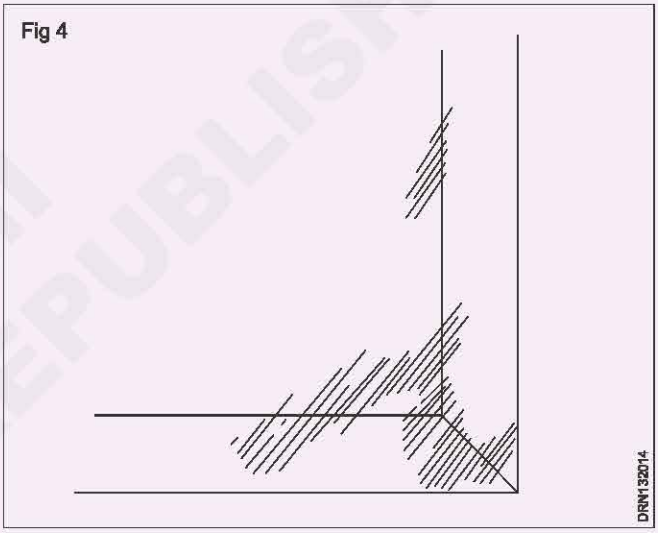


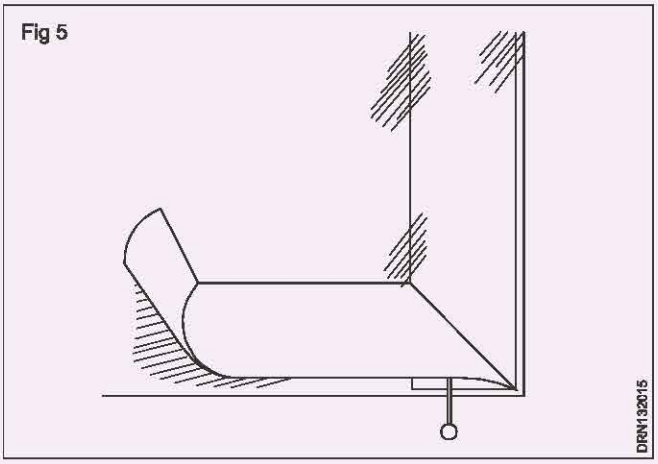

Fig 4




See the other methods of mitring which are explained below to use a separate strip or band to form the corners. They all can be finished as inward or outward corners.

**Mitring with flat tape or ribbon** is done mainly to create a decorative effect on the right side. The size of the garment material remains the same. (Fig 5)

Fig 5

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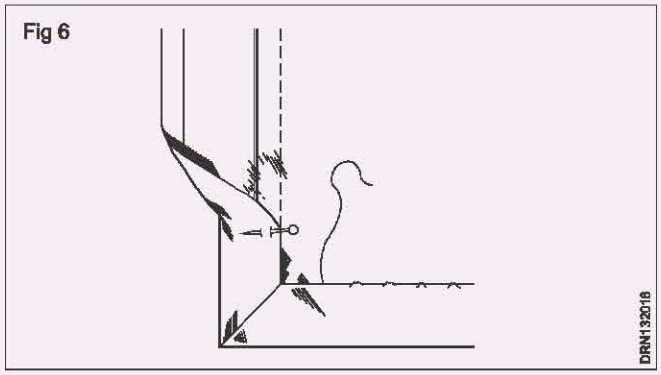
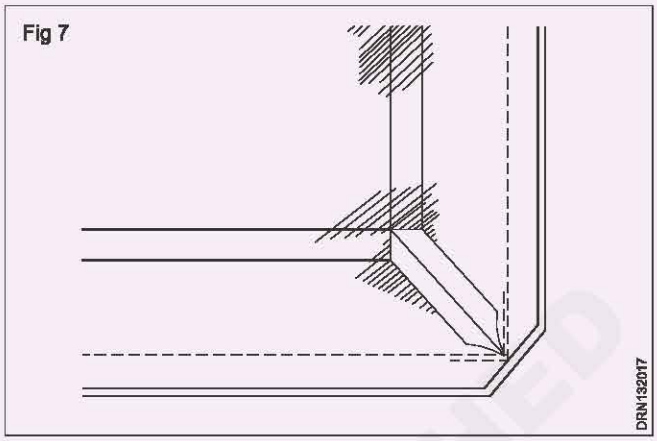
**Mitring with banding** always extends the size of a garment (material). It is used to give a decorative effect as a border or it is used for alteration of length etc., e.g. in children's garments. The banding is always finished on a double layer. (Fig 6)

Fig 6




**Mitring with bias facing** is mainly used for neckline finishes of square or V-shape. Here the facing must be stretchable, therefore a bias strip is used. Because of the stretchability, this corner finish will give a flat appearance. The bias piece can either be readymade or self-made of light weight underlining fabric. (Fig 7)

Fig 7

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# Casing

**Objectives:** At the end of this lesson you shall be able to
- **define casing**
- **explain types of casing.**

A casing is a fabric tunnel through which elastic or a drawstring can be threaded to pull in or draw up the fabric. Casing can be used at sleeves and pants hems as well as for garment waist bands. The most common use of casings is for waist bands on pull on pants and skirts, pajamas. This is best suited for straight edges. Waistline casings are practical because they can be adjusted easily to change in waist measurement - merely tighten or loosen the drawstring or elastic.

A casing should 6 cm wider than the elastic (or drawstring) so the elastic or drawstring can move easily through the tunnel, but not so loose that it twists easily.

There are two types of casing

a. Fold down casing

b. Applied casing

**Fold down casing**

A fold down casing is formed by turning an extension at the garment edge to the inside and stitching it in place. Fold down casing are of three type

1 Casing with drawstring - Used in Petticoat, pull on pyjamas

2 Casing with elastic - Used in baby garments, pants etc.

**Applied casing**

An applied casing consists of a separate strip of fabric that is stitched to the area to be drawn up on either the outside or the inside of the garment. If the casing is inside but the drawstring is required outside, provision is to be made to lead the drawstring outside. This can be done with button hole or with opening in the seam. An applied casing may be sewn on a one piece garment that has no waistline seam.

A casing sewn from inside may be of light weight lining fabric or a readymade bias binding to reduce unnecessary bulk. The applied casing also act as facing for a top edge of pants and skirts and the lower edge of blouses and jackets. Applied casing from outside may have of same colour and material or of contrast colour fabric.

3 Inside applied casing - Used in the waist line of jackets/ dresses/ pants etc.

4 Outside applied casing - Used in the waist line of jackets/ dresses/ pants etc.

Casing with heading can be formed on either type of casing having free edge. This is done after making a tunnel, stitch a second row of after the desired depth of the casing. When the casing is drawn up it will gather the heading automatically.

**Safety precautions**

1 Lines should be parallel to grain.

2 Elastic may not twist inside the casing.

3 Back/ secure stitch should be there to secure the open ends.

4 Always remove the tacking before finishing.

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# Neck Lines and edge finishing

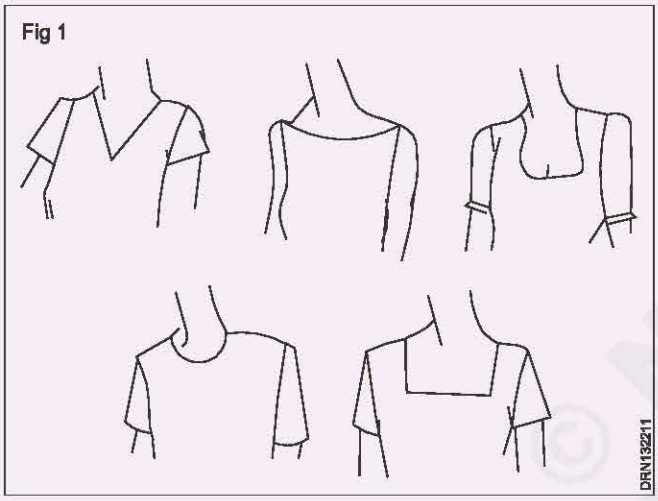
**Objectives :** At the end of this exercise you shall be able to

- **explain the different types of neck designs**
- **name the different methods of finishing raw edges.**
- **describe the main difference in facing, banding and binding and their suitable application.**
- **explain the required materials for bias piece.**

The design of the neckline generally is given importance, since it will influence the style of the garment and it should suit the person wearing the garment. Neck lines must be finished with special accuracy since they attract the attention easily.

All neck designs can be regarded as variations of three main shapes: round, square and V-shaped. (Fig 1)

Fig 1




If the plain shape shall be highlightened no decorative elements like frills etc. are attached. Instead the neckline is finished by a facing piece which is invisible from right side.

There are different methods of finishing a raw edge in a garment, as on bottom, arm-hole, neckline etc. Beside hemming, that is turning up the raw edge on the wrong side of the garment, there are two more methods of edge finishing which are **facing and enclosing of edges.**

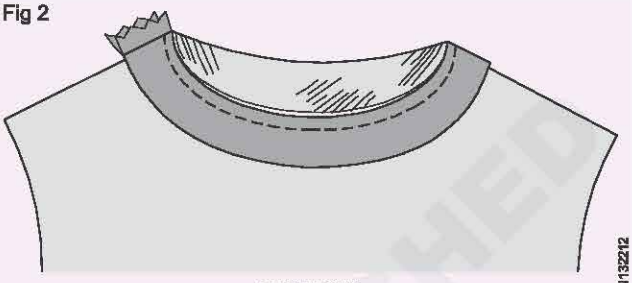
The material used for facing and enclosing of edges can be cut on the straight grain or on the bias, i.e. at a 45°angle (diagonal) to the warp and weft.

Bias is mainly used on curved areas to ensure that the material can be stretched.

**Facing** is the method where a piece of fabric is used to finish the raw edge on wrong side of the garment. Facing can be done as bias facing or shaped facing.

**Bias facing** is applied on a curved edge and done with the help of a strip. (Fig 2)

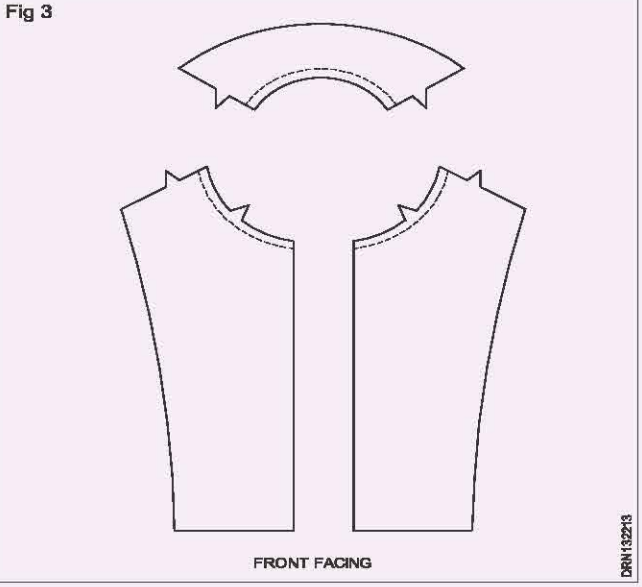
Fig 2




It is usually turned to the wrong side of the garment and will not be visible from right side. It is only turned to the right side if a decorative effect is desired. When bias facing is applied on inward curves it should be eased while stitching (easing means holding bias strip slightly loose at the seam line) and for outward curves it must be notched for stretching (since the circumference increases). It is mainly applied on the neckline, armhole and on hemline in skirts or sleeves.

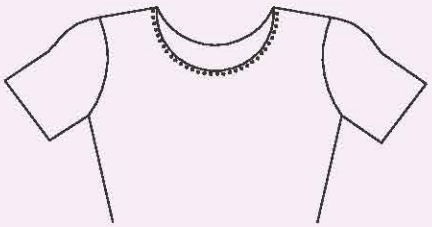
**Shaped facing** can be of any width. It is cut to the exact shape of the garment edge to which it is to be applied, usually it is cut on the same grain as the section of the garment it faces. It is often used to finish square or V necklines. It is easier to apply than bias facing and is less conspicuous. It is usually cut separately for front and back. It can also be used on armhole (sleeveless). Here the facing must be matching with the wrong side of garment, so that it will be right side out when finished. (Fig 3)

Fig 3



A topstitch is very close to the neck shape line from right side is a must. This ensures that the facing stays flat on the neck shape. (Fig 4)

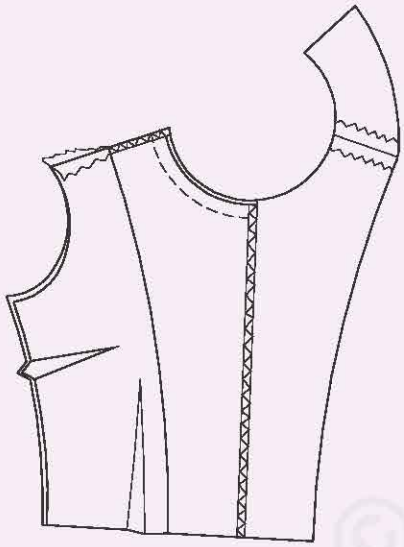
Fig 4



DRN132214

**Expanded facing:** If the facing piece is cut as an extension of the garment (e.g. on front opening) it is called extended facing. (Fig 5)

Fig 5

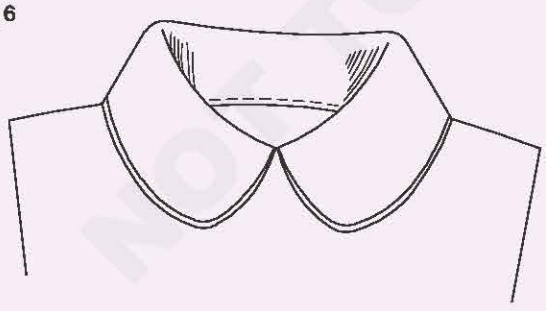


EXTENDED FACING

DRN132215

**Piping** is a method for a decorative edge finishing. It is cut from the bias material. The pipe is stitched between the two layers of fabric to, form a flat welt on the edge. The pipe can also be filled with a cord to make the welt stronger and more conspicuous. (Fig 6)

Fig 6

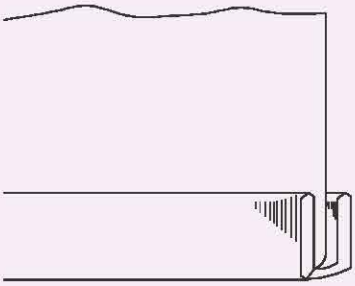


DRN132216

**Enclosing of edges:** This type of edge finishing can be done with straight or bias material.

**Binding** is used to finish and straighten raw edges or to add a decorative trim to a garment. It is a neat finish also for reversable garments. It is used to finish necklines, armholes, sleeve edges, front closings, collars, cuffs and seams. Ready made bias binding piece can also be used.(Fig. 7)

Fig 7

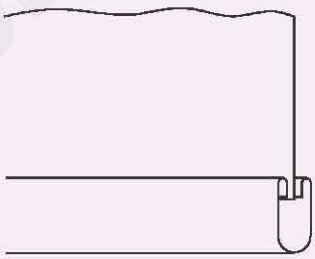


DRN132217

Bias bindings can be applied in two ways: Single binding is cut to double the finished width plus two seam allowances. Bindings are handled in the opposite manner to facings at Inward and outward curves. Stretch bias on inward curves and eases it in outward curve Double binding or French binding is used on sheer fabrics. Here the width is four to six times the required width. The binding piece is folded first and applied to the garment. It gives a corded effect when finished.

**Banding** is an extension of a garment on the raw edge for example hemline and neckline. The width of banding can vary according to the desired length. When used on hemline it is cut on the same grain. A contrasting material can also be used. When applying bias piece as banding on curved shapes, only a narrow width is used. (Fig 8)

Fig 8



DRN132218

The following factors are to be considered while finishing necklines.

The design of facings and collars should harmonize well with the fabric design, i.e. big and bold floral designs, checks or stripes are not suitable.

When designing the neckline, the purpose of the dress is important. For casual wear and uniforms prominent decorative features are avoided.

While selecting the shape of the neckline the individual features of the wearer must be taken into consideration; the following combinations are suitable:

- Round face - long pointed collar or V-neck
- Thin and long necks - standing collar or close neck
- Broad face and short neck - long pointed collar or wider neck shapes
- Long slender face - short collar points and broad spacing between the points or close neck.

**Important hints to avoid trouble while stitching:** To avoid bulge on the edge or comer of the neckline notches should be given on inward curves.

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To avoid bulge on the neckline edge of right side facing top stitching must be done on the right side close to the neckline and the shoulder seam allowance should be pressed open.

On square and V-shaped necklines clipping should be done at the corners or at points. This is to avoid bulging and to prepare for a flat set.

If a narrow facing is used it is hemmed to bodice fabric. Be careful to catch only one thread from the garment section and don't pull the thread tight. Otherwise stitches are visible from the right side.

**Materials requirements for bias strips**

A bias strip is a strip of material which is cut diagonally to the warp and weft yarns. Since it is very stretchable and suitable to finish edges.

The shape of the material required for cutting a single bias strip is always a square.

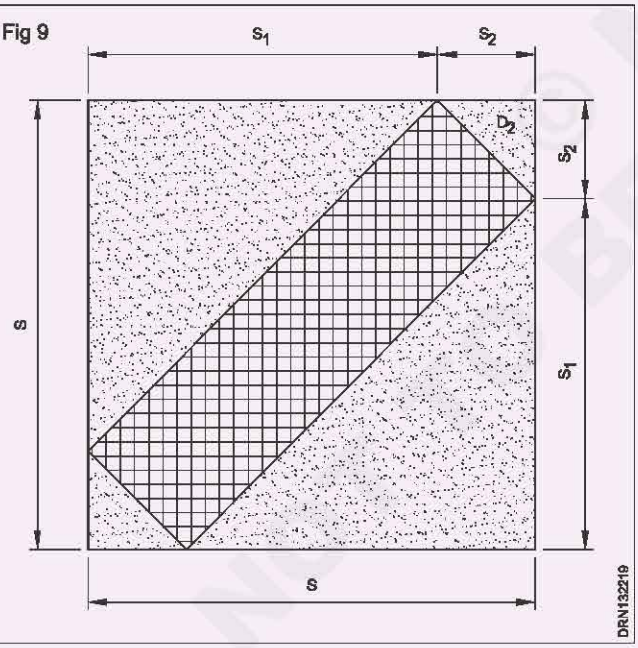
s = length of edge of square material

s = s1 + s2

s1 = lateral side of the isosceles right-angle triangle D1, in which the length of the bias strip functions as the hypotenuse

s2 = lateral side of the isosceles right-angle triangle D2, in which the width of the bias strip functions as the hypotenuse.

Fig 9




From the theorem of Pythagoras it can be deduced, that the hypotenuse of the isosceles right-angle triangle is 1.4 times of the appropriate lateral sides.

Length of bias strip = s1 x 1.4

Width of the bias strip = s2x1.4

Side length of the square s = (length of strip x 1.4) + (width of strip x 1.4)

***Example 1:***

A bias strip of 20 cm length and 2 cm width is required. What is the side length of the appropriate square piece of fabric if the strip is cut on the true bias?

Answer:

20 cm: 1.4 = 14.28 cm (length of the lateral side s1)

2 cm : 1.4 = 1.42 cm (length of the lateral side s2)

14.28 cm + 1.42 cm = 15.7 cm

The side length of the square of fabric has to be 15.7 cm.

**Explanation:**

If the length of strip is 1.4 times the length of the lateral side of triangle, then vice versa the length of the lateral side of triangle is the 1.4th part of the length of strip.

**Example 2:**

A square piece of fabric with 65 cm side length is available to cut a 3 cm wide bias strip. What is the length of the bias strip if it is cut on the true bias?

**Answer:**

3 cm: 1.4 = 2.14 cm (length of lateral side s2)

65 cm - 2.14 = 62.86 cm (length of lateral side s1)

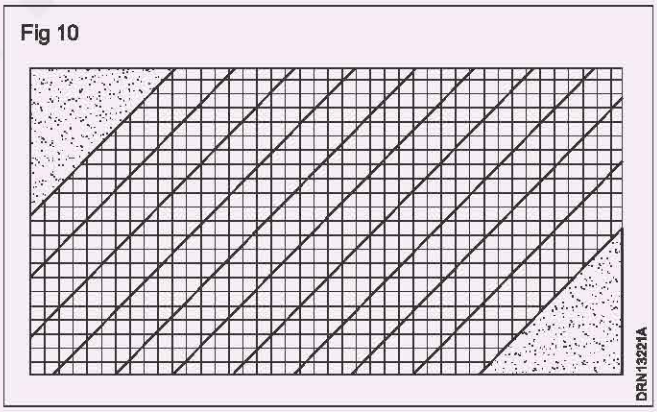
62.86 cm x 1.4 = 88 cm

The length of bias strip will be 88 cm.

**Joined bias strips**

If the bias strips might be joined the layout will become much more economical. The strips can be laid out side by side. The shape of the fabric will be rectangular. Fig.10

Fig 10




**Example 1:**

A bias strip of 5 m length and 2.5 cm width is required. The shortest strip shall be of 10 cm minimum. The fabric available is of 86 cm width. How much material is required?

Answer:

500 cm x 2.5 cm = 1250 cm (surface of the strips)

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| | | |
|---|---|---|
| 10 cm : 1.4 cm | = | 7.14 cm " 7.1 cm (lateral side of balance triangle) |
| 7.1 m x 7.1 cm | = | 50.41 cm2 (surface of both balance triangles) |
| 1250 cm2 + 50.41 cm2= | | 1300.41 cm2 (surface of the fabric) |
| 1300.41 cm2:86 cm | = | 15.12 cm m 15.5 cm (rounded to the next higher) |

**Explanation:** The total surface of the fabric is calculated by adding the balance material to the surface for the strips. The length of the piece of fabric is calculated by dividing the total surface into the width of fabric.

The result should always be rounded to the next higher number. Why?

**Example 2:**

A piece of fabric of 96 cm width and 20 cm length is available. What is the length of a joined bias strip of 2 cm width? The minimum length of the single strip shall be 10 cm.

| | | |
|---|---|---|
| 96 cm x 20 cm | = | 1920 $cm^2$ (surface of the fabric) |
| 10 cm x 1.4 | = | 7.14 as 7.1 cm (lateral side of the balance triangle) |
| 7.1 cm x7.1 cm | = | 50.41 cm2 (surface of both balance triangles) |
| 1920 cm2-50.41 cm2 | = | 1869.59 cm2 (surface of the strips) |
| 1869.59 cm2:2 cm | = | 934.79 9.34 m (rounded to the next lower) |

**Explanation:** The calculated surface of the bias strips can be projected as a rectangle of 2 cm width and an unknown length. The length of strip is calculated by dividing the surface of strips into the width of strips.

The result should always be rounded to the next lower number. Why?

**Exercises**

| Length of strip | Width of strip | Side length of square fabric |
|---|---|---|
| a) 20 cm | 2.5 cm | ? |
| b) ? | 3 cm | 40 cm |
| c) 75 cm | ? | 62 cm |

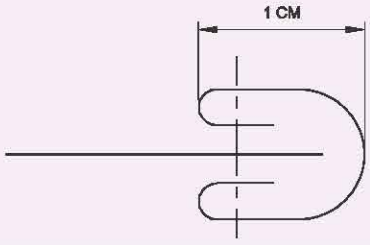
I. Calculate the missing values for single stripsII.

| Length of Strip | Width of Strip | Width of fabric | Length of fabric | Minimum length of single strip |
|---|---|---|---|---|
| a) 10 cm | 2cm | 1.10 m | ? | 10 cm |
| b) 8 cm | 2.5 cm | 0.80 m | ? | 15 cm |
| c) ? | 2 cm | 1.20 m | 50 cm | 10 cm |
| d) ? | 2.5 cm | 0.90 m | 25 cm | 8 cm |

II Calculate the missing values for joined strips!

III Several edges of a dress shall be finished with bias binding. The single stretches of edges are 62 cm, 2 x 45 cm, 2 x 35 cm, 2 x 40 cm. Seam allowance regarding width of strip is 0.5 cm for each edge. Seam allowance for joining the strips will be 9 cm in total. What quantity of material is required if the width of fabric is 0.72 m? The minimum length of the single strip shall be 10 cm. (Fig11)

Fig 11

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# Plackets

**Objectives:** At the end of this lesson you shall be able to
- **name the function of a placket**
- **explain the different types of plackets and their application.**

**Plackets** are finished openings, constructed to make it easy to put on or take off a garment. When the garment is in use, generally plackets are kept close with the aid of fasteners such as zips, buttons etc. They are used at waistline, neckline, sleeves (wrists) and other snug fitting parts of a garment.

A placket may be made in an opening left in a seam or in a slash cut in a garment. The former is stronger and gives a better finish when completed. A placket should be as inconspicious and flat as possible, unless it is used as a decorative element in a garment.

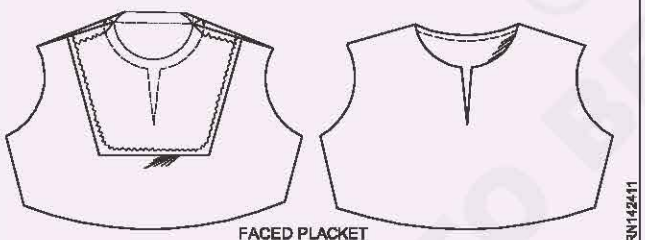
In women's garments, placket should lap **right over left**, in gent's garments **left over right**.

Except in zip plackets, one or two facing components are used to finish the edges of the placket opening.

Features and use of plackets

**Faced placket** is used in front or back neck line for a short opening. A separate placket piece is first stitched in place and slashed after. In fine material self material with lining is used. (Fig 1)

Fig 1



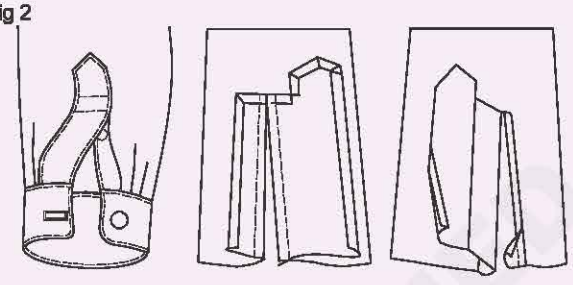
FACED PLACKET

DRN142411

**A two-piece placket** is generally used on upper garments with a loose fit. For the construction of this placket, two separate pieces (facings) of self material are used. One smaller width for the facing and the wider width for the bound. When finishing this placket on jibbas and on sleeves the wider width is overlapped on the narrow facing piece. The end is finished in a square or mitred (triangular) shape. When the placket is used in waistline, the narrow piece overlaps the bound piece. Lock stitch is done at the end of the placket. (Fig 2)

**Italian placket** is similar to the two-piece placket. The only difference is, that the two pieces are of the same width. It is commonly used on men's shirts sleeve openings and in half opened shirt as well as in children's dresses.

Fig 2



TWO PIECE PLACKET

DRN142412

**Continuous plackets** are used in slashes. They are best suited for full gathered sections and also on umbrella skirts, children's dresses and sleeve cuffs. The placket strip (facing) is cut in widthwise direction of the self material. It is not suited for curves or bulky fabrics. (Fig 3)

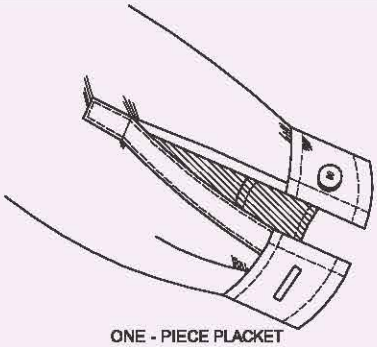
Fig 3

ONE PIECE PLACKET
CONTINUOUS PLACKET

DRN142413

**One-piece placket** is used only on shirt sleeves. One side has a self hem and the other side has a bound piece, that may be finished in square or V-shape for better appearance. (Fig 4)

Fig 4



ONE - PIECE PLACKET

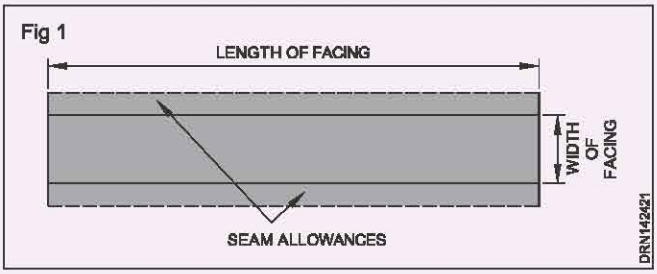
DRN142414

## Calculation: Material requirements for facings

**Objective:** At the end of this lesson you shall be able to
- **calculate the material required for facings.**

Facings are strips of cloth, straight or curved, which are used as designing aids on, in or at dress items. (Fig 1)

Fig 1




***Example:*** A facing of length 2.80 m is required. The contemplated width of the facing is 5 cm; an extra 2 cm is to be provided for the seams.

The material from which the facing is to be cut has a width of 90 cm. How much material is required?

**Solution**

2.80 m : 0.90 = 3.1 .... (strips) ——> 4 strips

5 cm + 2 cm = 7 cm

7 cm x 4 = 28 cm

**Extras for the seams for sewing together the facings are ignored here and in the following exercises.**

**Exercises for practice**

1 Calculate the material required :

2 For an item of dress a facing of length 3.10 m and breadth 6.5 cm is required. A total extra of 3 cm is to be provided for the seam at the width of the facing. How much cloth (material) (of 1.10 m width) is required?

3 A frock is provided with 2 facing strips all around, alongside the hem and parallel to the seam-edge. The width of the frock is 1.30 m for both the strips; the width of the strip is 3.5 cm. For sewing on the facings an extra 2 cm to the facing width should be taken into account. (How the facing strips are sewn together is immaterial). How much material (= cloth) (of width 0.90 m) is required for the facings?

## Zipper

**Objectives:** At the end of this lesson you shall be able to
- **explain the different zipper types**
- **explain the various zipper applications.**

**Zipper plackets** can be finished with different types of zippers. The basic type of zipper is the chain zipper, a medium weight zipper with metal or plastic teeth closed at lower end.

**Ladder or coil zipper** has synthetic coils of polyester or nylon attached to a woven tape. It is also closed at one end.

**Invisible/concealed zipper** is a type of coil zipper and has teeth that are concealed on the underside, so that the zipper is invisible from right side.

**Open end zippers** are open at both ends, usually long and heavy. They are mainly used in jackets, track suit tops, waist coat, kameez etc.

Zippers are opened and closed by a slider which moves up and down. The top stop and bottom stop keeps the slider from running off the zipper.

There are several ways of inserting zippers, the method depends upon the position in the garment and the type of garment. Generally zippers are either concealed in a lapped seam with only one line of stitching visible, or they are centred under a channel seam with two lines of stitching. In some dresses, it is also desired to keep the zipper visible. (Fig 1)

**Centred application** of the zipper is either visible application or invisible application. It is constructed at the centre front or centre back of the garment.

**Lapped zipper application** is commonly constructed at a seam line. In this method one zipper section is applied to project out on the underlap layer and the other stitched on the corresponding overlapping layer of the garment placket.

**Open end zipper application** is a special kind of application, where both the zipper sides are open fully and stitched separately to either placket sides. It is commonly used in upper garments.

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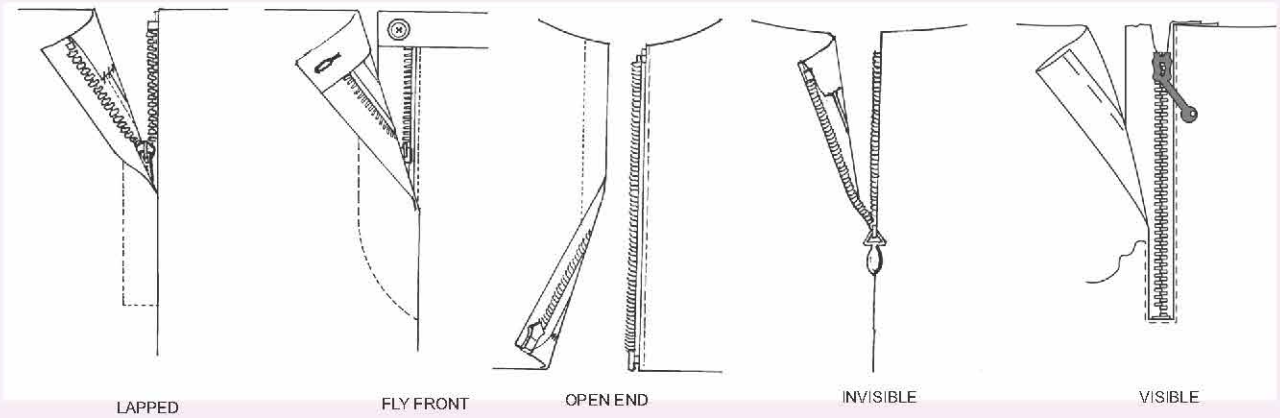
Fig 1




ZIPPER PLACKETS

DRN14-2431

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# Pockets

**Objectives:** At the end of this lesson you shall be able to
- **name and distinguish between the different types of pockets**
- **name the different components required.**

A **pocket** is a small bag stitched to a garment for carrying money, handkerchiefs etc. Pockets besides having this functional meaning they are also made for decorative purpose. Care should be given to their size, shape and location since they attract the eye.

The **pocket position** should be at a level that is comfortable for the hand to reach. If it is on the upper body garment it should be on the chest line or just below the waistline. In lower garment (skirt or trouser) the position is on back or front hip line and also on the side seam just below the waistline. But for decorative purpose it can be placed anywhere, according to the fashion, like above knee and elbow for example.

Children love to have pockets in their dresses. These pockets can be designed to various shapes and sizes with decorative details such as lace, ruffles, tucks, pleats, embroidery etc.

A pocket might consist of different components depending on the type of pocket:

Pocket pouch will appear either outside of the garment in patch pocket or inside the garment in all other types of pockets. In case of patch pocket the pouch is cut from the dress material otherwise strong lining material like poplin or gada is used mostly. The pouch material must be strong since it is meant to carry items inside.

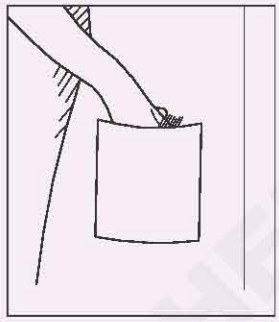
– Material for finishing the pocket mouth (flap or lip piece) is also taken from dress material.

– The jetting piece will also be cut from the dress material. It is used as an extension of the pocket pouch at pocket mouth on the right side of the garment (e.g. front-hip pocket, inseam pocket).

The position of pockets are marked in pattern. There are many methods for the construction of pockets, but in general they can be classified as three types:

The **patch pocket** is attached to the outside of a garment. It can be placed more freely to flatter the wearer or to highlight the design of a dress. They may seem to be easiest to stitch but since all the sewing lines are visible they have to be attached perfectly. Patch pockets may be cut in various shapes and may be finished with a flap which covers it partly. A cardboard template cut to the pocket shape and size is helpful for guiding during the stitching and pressing process. If the pockets are to be used in pairs it has to be taken care that the finished pockets look exactly same. (Fig 1)

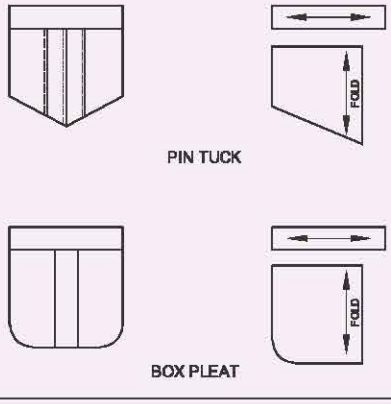
Fig 1




Some of the patch pocket designs are given below:

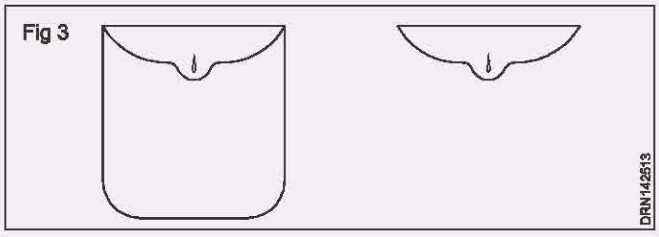
Pocket pattern might be cut into two section a patch piece and a lip piece. The patch piece is folded lengthwise, then an extra material is added on the fold for pin tucks or box pleat. (Fig 2)

Fig 2



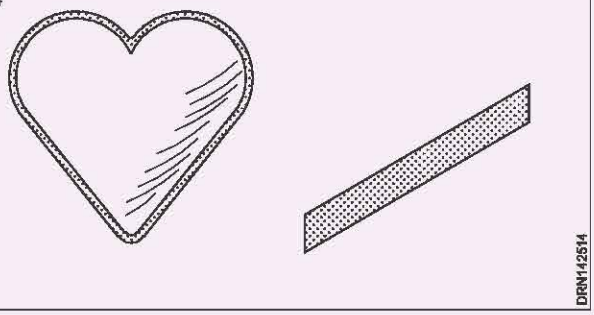

For shaped flap, the flap piece may be cut in double layers to avoid showing the unfinished inside part of the flap, to hang firmly and to give a neat finish. The flap is finished and then attached to the pocket mouth from the right side. (Fig 3)

Fig 3



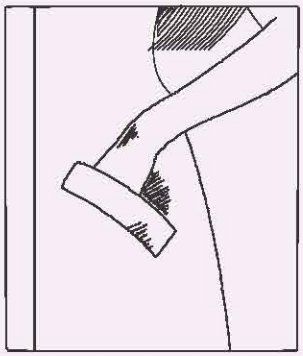
The edges of a shaped patch pocket can be finished with a bias strip. (Fig 4)

Fig 4



**Slashed pockets** are used on the chest line, waistline and just above the hip line. They are made by slashing the fabric for pocket mouth. The edges are then finished in different ways. In this type of pocket, the pocket pouch hangs on the wrong side of the garment. The lower raw edge can be finished with a lip piece that is covering the upper raw edge. (Fig 5)

Fig 5



If the lip piece is wider, the pocket is called welt pocket. Here the lip piece should be of widthwise material. If the lip piece is of narrow width then it is known as bound pocket. For this finish the lip piece should be of lengthwise material. This finishing method is similar to the bound button hole and it can be of either single or double piece.

It is also possible to finish the upper raw edge with a flap, covering the lower raw edge. This type of pocket is known as flap pocket, suitable for coats and pants.

The two raw edges of a slashed pocket can also be finished with a zip. (Fig 6)

Inseam pockets are always placed in the seam of a garment. Here the pocket piece also hangs on the wrong side of the garment. This pocket is placed on the hip level of side seam in skirts and trousers. (Fig 7)

The front-hip pocket starts from waistline and ends in side seam line of a lower garment. Its pocket mouth can be finished in straight, diagonal or curved shape. (Fig 8)

**Hints for stitching pockets**

– to avoid wrinkles on the outer edge of patch pocket, ease stitch should be given on the curved area before stitching.

– to avoid bulge at the corners or outer shape of pocket on a heavy weight fabric, notches should be given.

– on either side of pocket mouth stitches must be strengthened by giving a straight or triangular bar or else the stitches may come off due to frequent usage.

Fig 6

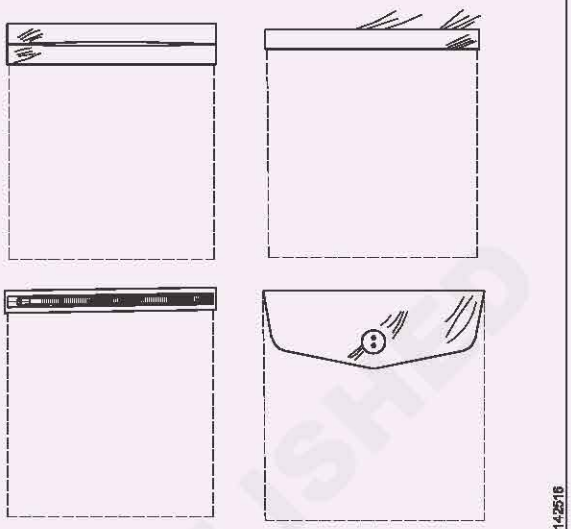


Fig 7

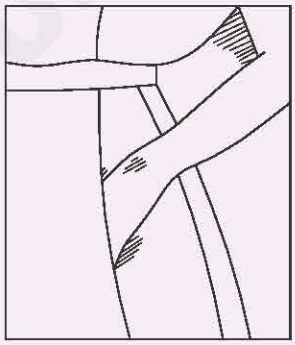
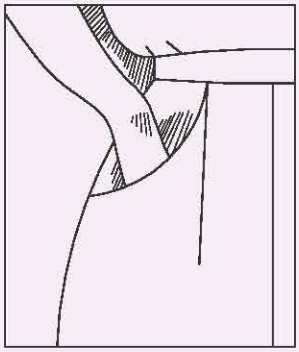


Fig 8



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# Collars

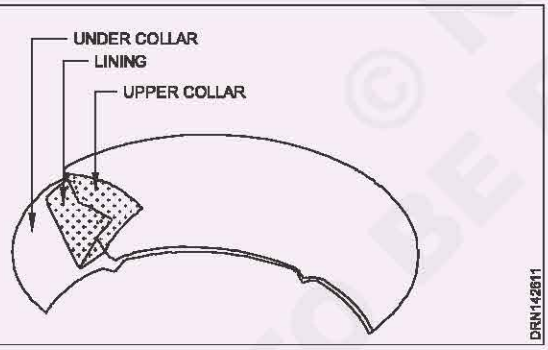
**Objective:** At the end of this lesson you shall be able to
- **explain different types of collars and their application.**

A **collar** is attached to the neckline of a garment in order to enhance its appearance. It also serves to finish the raw edges at the neckline. It can either be close to the neck or away from neck or raised from neck level.

Collars are made from either single or double section of fabric and attached to the neckline, so that the ends meet, either at the centre front or back. This depends on the type of collar or fabric and shape of the neck.

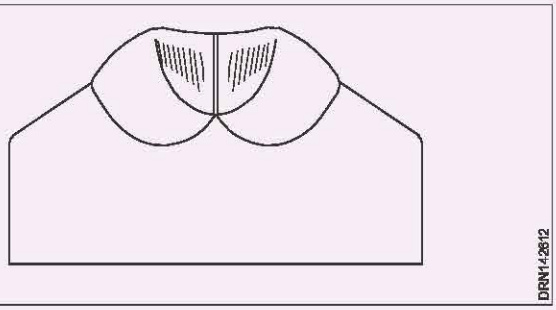
Collars are made of double layers of fabric (with or without an interfacing) with the outer edge hanging free (except in mandarin). The top layer is the upper collar. The lower layer is called under collar. In between these layers light or medium weight sew-in or iron-on interfacing is applied. Same material as the dress material can be used or canvas or iron-on, depending upon the garment fabric. Iron-on interfacing is steam pressed (with moderate heat temperature used for silk or wool) onto the whole top collar piece. The iron-on has one side coated with a fusible adhesive, available in woven and non-woven form. It strengthens or stiffens the part where applied. (Fig 1)

Fig 1



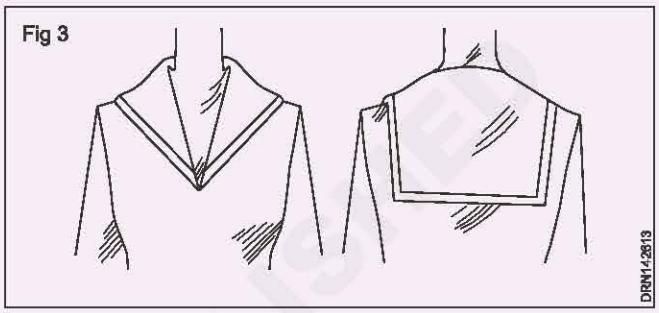

Flat collar emerges from the neck seam line to lie flat against the garment. The neck shape can be close or wider. Variation of this collar is Peter Pan collar. It is a round flat collar and can be of one or two pieces. If the dress has a back opening then a two piece collar is applied. Since collars are of two pieces, you need four sections for two piece collar. One piece Peter Pan collar is used on front open dress, widely used on children and girl's dresses (Fig 2).

Fig 2



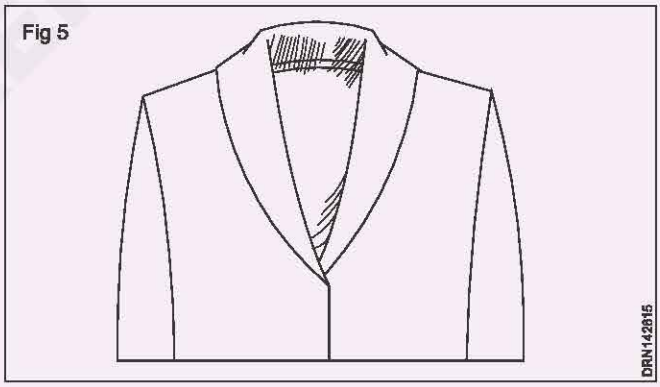

The other variation is sailor collar. It has a 'V' shape in front and square at the back. If the dress has no front opening. The front collar should be cut in V shape identical to that of the neckline. This collar is suitable for babasuits and little girl's dresses. (Fig 3)

Fig 3




Rolled collar : Part of the collar stands up at the neck edge (called the stand). The stand section may be the same depth all around or higher at the back and gradually reducing in depth towards the front. The imaginary line dividing the stand and fall is called the roll line. This collar is suitable for blouses, jackets and coats. (Fig 4)

Fig 5




Variation of this collar is shawl collar. This is the only collar which is not cut separately but with the front piece. It is cut as an extension of the garment front itself. The collar is formed by folding this extension back over the garment after applying shaped facing. The fold itself forms the neckline of the garment. This collar combines the top and lapel if the collar is in one piece. It is cut with a smooth curve at the outer edge. The stand section of this collar gradually tapers down to a point at the centre front. A seam will appear on the centre back neck. (Fig 5) This collar is suitable for jackets and coats.

The other variation is the convertible collar (tennis collar). It can be worn closed or open. It is cut as single section and the collar the neck should not have a deep, round shape. The front collar is slightly away from the centre front. (Fig 6)

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Fig 5

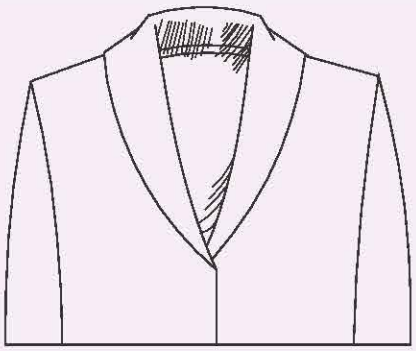

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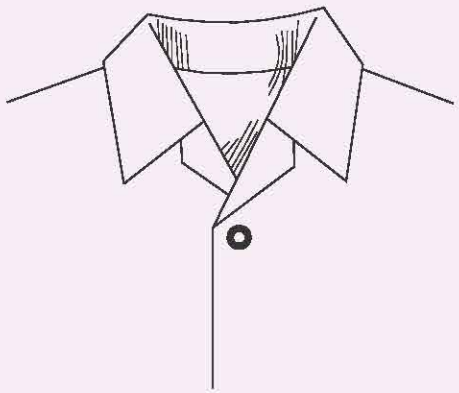
Fig 6



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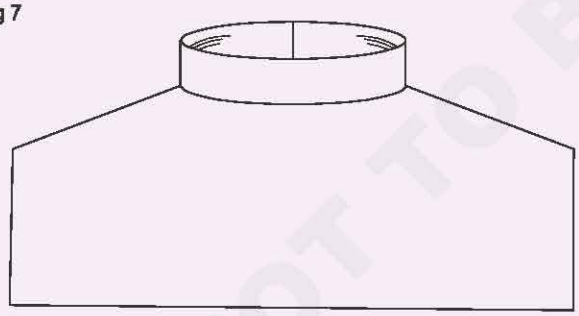
**Stand collar or mandarian collar:** The neckline edges of this type of collar has convex curve and the collar stands up close to the neck. It can be made from a narrow band or a wider one that folds back on itself. This collar can be one piece or two pieces made from a rectangle of a fabric, sometimes cut on bias. It extends upwards from the neck seam line. The corners may be curved or squared. (Fig 7)

Fig 7



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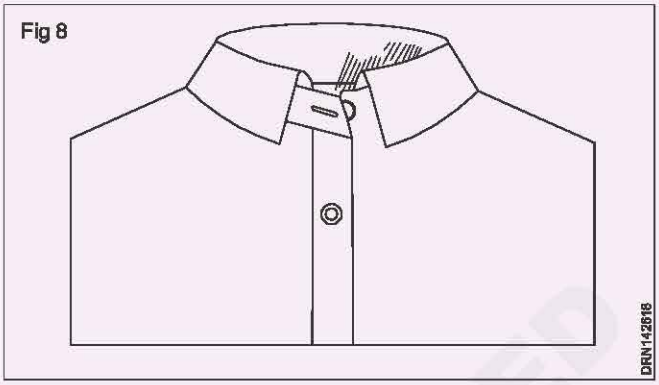
Variation of this collar is the **shirt collar with stand.** This collar has a stand and collar piece that folds down over the stand. The stand or the band may be cut as a separte piece or as one piece with collar. The stand raises upwards from the neckline. It is frequently used in gent's shirts.(Fig 8)

Fig 8



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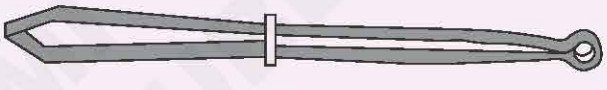
During process of collar making the Bodkin is an useful tool to bring out the corners of collar after turning to right side. (Fig 9)

Fig 9



BODKIN

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# Sleeves

**Objectives:** At the end of this lesson you shall be able to
- **describe the different types of sleeves and their construction features**
- **explain the function and the application of a gusset piece.**

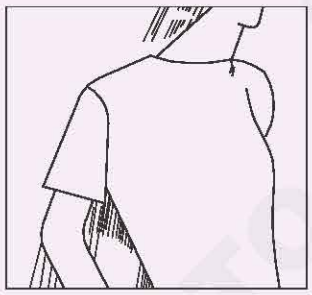
A garment can be of sleeveless or can be finished with a sleeve. This is very much depending on fashion, season (often summer dresses are of sleeveless style) etc.

Sleeves come in various styles. They differ in look and method of construction. This is concerning the way the sleeve is joined with the upper garment and the way the sleeve is shaped and finished at the bottom.

A sleeve can be of different length, depending on the design of the garment. The sleeve bottom can be flared, gathered or tapered. Finishing can be done with facing, binding, by attaching a sleeve band or by attaching a cuff. For a good fit of a long sleeve shaping is given at the elbow. In some cases darts or ease stitching is given at the back. This is done to give room for the elbow to bend without straining or tearing the fabric.

Three basic types of sleeves can be distinguished: the set-in sleeve, the raglan sleeve and the cut-on sleeve (kimono sleeve). The set-in sleeve is cut and stitched separately and then seemed to the armhole of the garment. Generally the sleeve crown rests exactly on the shoulder line. (Fig 1)

Fig 1



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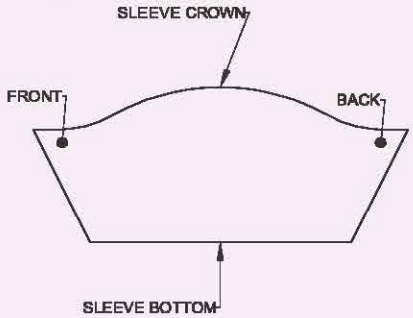
In some styles of dresses the shoulder part is overlapping so that the sleeve crown rests on the upper arm. The front of the sleeve crown has a deeper curve than the back. (Fig 2).

Fig 2

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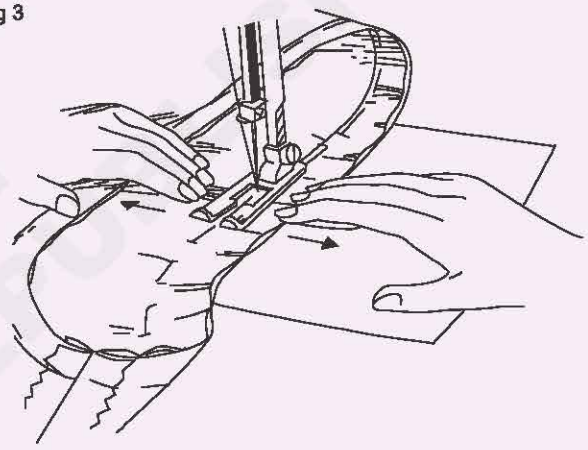
The sleeve armhole circumference when compaired with the bodice armhole circumference is slightly more. While attaching the sleeve to the armhole this excess material on the sleeve crown should be set with ease stitches.

**Hints**

– To avoid wrinkles on armhole (bodice of the garment) while stitching the excess material to the armhole the edge of armhole may not be stretched. Instead pull excess material (ease) to both the sides. (Fig 3)

Fig 3



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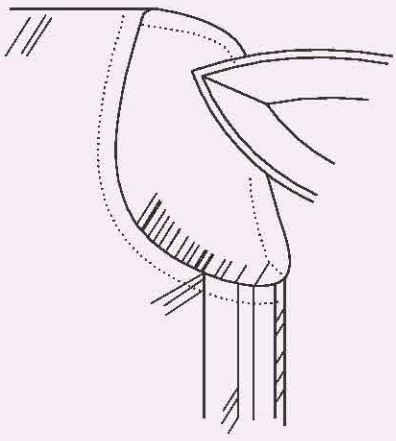
– The set-in sleeve seam is neither pressed to the sleeve nor to the bodice comonent. It is kept free and also it is not pressed open. (Fig 4)

Fig 4



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Mostly the sleeve is of a single piece, but in coats and jackets it is often constructed with two pieces. Here the pieces are curved to follow the shape of the sleeve and the seam is positioned at the back. The two pieces are joined before the sleeve is set in to the armhole.

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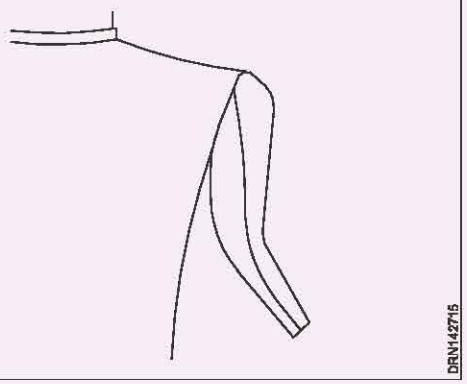
In one-piece sleeves the underarm sleeve ends in side seam of bodice. But the seams of two-piece sleeves never end in side seam of bodice. (Fig 5)

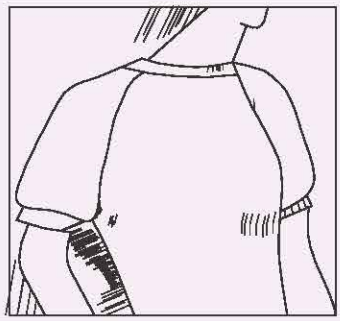
Fig 5




A variation of set-in sleeve is called the shirt sleeve which is attached to the armhole in a different method (shirt-sleeve method). Here the sleeve is attached to the armhole before both, the garment side seam and the underarm sleeve seams are stitched. Since the sleeve crown is not deeply curved, case stitching is not required.

Another type of sleeve is the raglan sleeve, in which part of the bodice is combined with the sleeve. It has loose armholes and is ideal for coats, since they require more room for the other garments to be worn underneath (Fig 6).

Fig 6

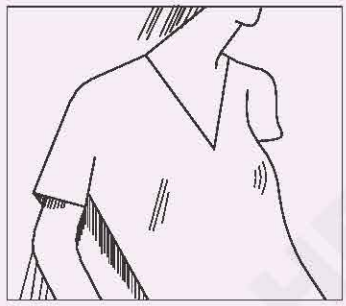



The armhole seam of a raglan sleeve runs from the neckline to the under arm (scye) and back to the neckline. This sleeve covers the entire shoulder area. It can be made of one piece, then sloping is done with the help of a dart along the shoulder line. For this sleeve the underarm and side seam are stitched after finishing the sleeve.

If the raglan is made from two pieces the sleeve is shaped with a seam that runs across the shoulder and down the outer arm. It will need clipping on curves that release strain. The raglan will also be joined before stitching the under arm seam and bodice side seam.

The **kimono sleeve** (cut-on sleeve) is cut as an extension of the main bodice piece. The front section of the sleeve is cut in one with the bodice front and the back section of the sleeve with the bodice back. It can be shaped with loose or close fitting. (Fig 7)

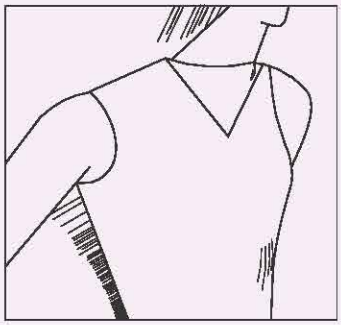
Fig 7




In loose fit there is no need for a gusset piece, but the under arm should be reinforced with a bias strip or tape before or after the seam is stitched.

If a sleeveless dress is chosen it is generally finished with a bias piece or shaped facings. Shaped facings are commonly cut in one piece with a joint at the underarm. If it is cut from two pieces a joint will appear at underarm and at shoulder. A very light weight interfacing adds stability. (Fig 8)

Fig 8




## Variations of basic sleeves and sleeve finish

**Objectives:** At the end of this lesson you shall be able to

- **describe the construction features for variations of basic sleeves**
- **explain different methods of sleeve finishes.**

Variety of sleeve styles can be developed from a basic sleeve pattern. (Drafting of sleeve pattern is explained in Ex.21). The styles depend on various factors like fabric, dress style and fashion.

The design can be achieved by manipulating the basic sleeve pattern itself. Most commonly used is the manipulation of a set-in sleeve. Here the basic pattern is either slashed or cut according to the style required.

**Set-in sleeve variation:** Puff sleeves are of short length. Medium and light weight fabric are best suited for this style. There are three types of puff sleeves. In the first type, the gathers are formed both at the top and at the bottom. The basic sleeve pattern is cut at the centre line and on both sides.

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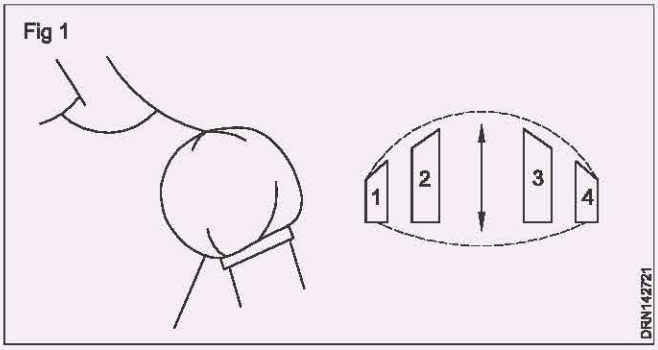
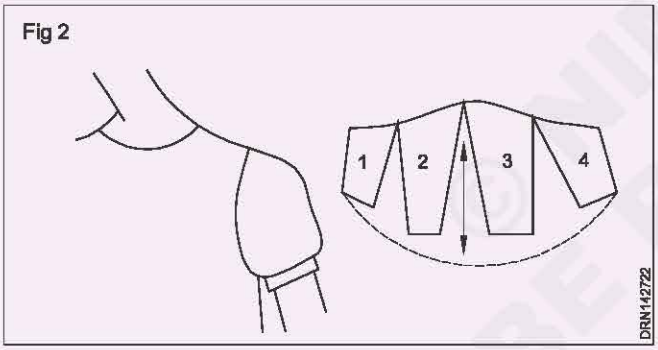
Then they are spaced apart to get more width and to achieve gathers at the top and bottom of the sleeve. The highest point of the sleeve cap is raised by 1.5 cm and a smooth curved line is drawn. Similarly the lower end of the sleeve is lowered by 1 cm at the centre point and a smooth curve is drawn. The top and bottom sections are gathered to the girth of the armhole and sleeve round. Then it is prepared like a set-in sleeve. (Fig 1)

Fig 1



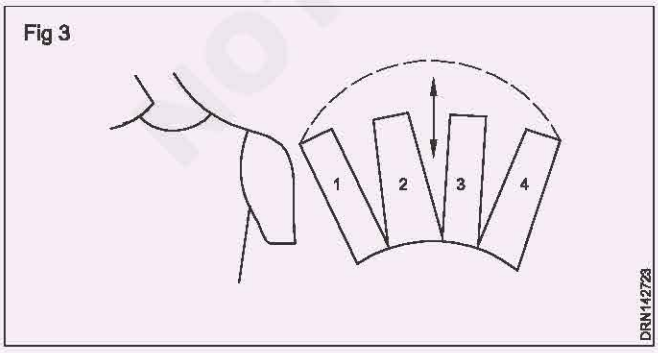

With the second type of puff sleeve, the gathers are only at the bottom. The sleeve pattern is slashed from the edge to the top and then spread to allow for fullness. After the sleeve is lengthened by 3 to 5 cm at the lower end and given a smooth curve as shown. The bottom section is gathered and finished with a band or bias binding or may be gathered using an elastic (explained below). (Fig 2)

Fig 2



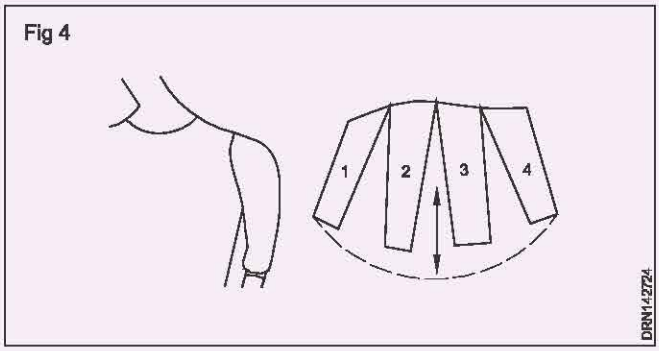

In the third variety the gathers are at the top end. The sleeve pattern is slashed from the top edge to the lower and spread to allow for fullness. Here the sleeve crown is increased and a smooth curved line is drawn. The top section is gathered to the girth of the armhole and prepared like a set-in sleeve. (Fig 3)

Fig 3



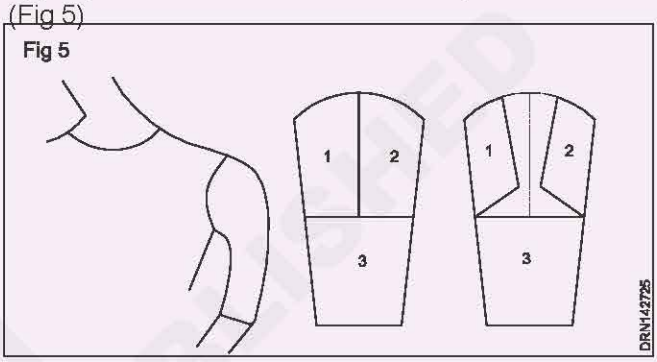

Bishop sleeve is a variation of the second type of puff sleeve. Here the sleeve is of full length or three-quarter length only. It has gathers at sleeve bottom, set into a band or cuff. (Fig 4)

Fig 4



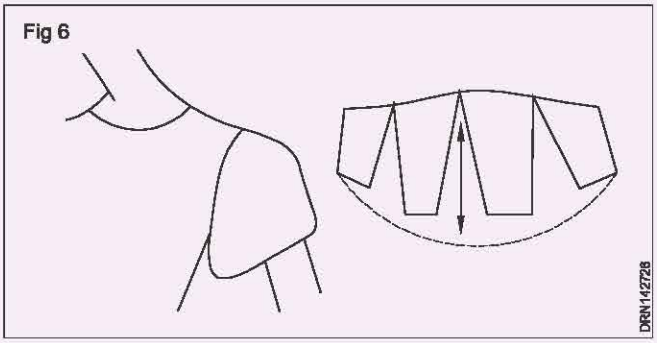

The Leg-O-Mutton sleeve is a long sleeve, which has a tight fitting below the elbow and puffed above, with gathers at the top edge. The basic sleeve bodice is used for the upper part. It is cut in centre line and spread as shown. (Fig 5)

Fig 5




Bell sleeve is also a variation of the puff sleeve. The bell sleeve is designed with more width at sleeve bottom, but the material is not gathered. The basic sleeve pattern is slashed from the bottom to top and spread open to get extra width. The centre bottom is slightly increased to give a bell shape. The sleeve bottom is finished with narrow hem or with shaped facing. (Fig 6)

Fig 6




Different from other sleeves the circular sleeve has no underarm seam. The bottom of the sleeve has a circular shape and the bottom circumference is more.

Notches at sleeve crown and armhole help to identify front and back part while attaching sleeve to the armhole. The bottom is finished with a narrow hem.

The sleeve pattern is cut into 4 sections which are positioned in such a way that sections 1 and 3 and 2 and 4 are positioned opposite to each other. The bottom edges of the sections are connected to form a circle. This will increase the circumference of sleeve bottom.

There is no change in the length and shape of sleeve top but the sections are arranged to form a type of circle. (Fig 7)

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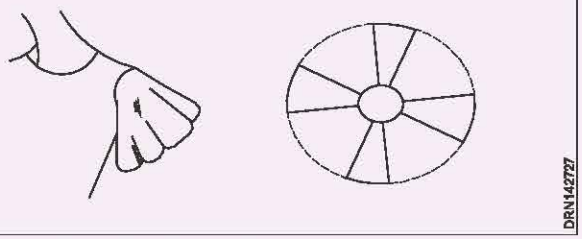
Fig 7



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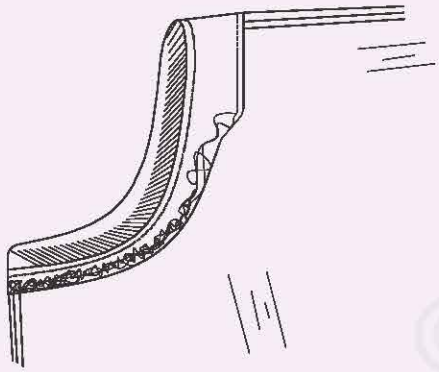
**Sleeve bottom finishes:** The lower edges of the sleeve are finished in many ways. This depends on the style, length of the sleeve and the fabric. It can be of self or contrasting fabric.

Sleeveless armholes are finished with shaped facing. It gives a smoothness to the edge. The facing may be cut in one piece with one seam joining it at one end at the underarm. But it is commonly cut in two pieces, the front and the back armhole facings. They are joined at the shoulder and underarm. A light weight interfacing gives more stability. (Fig 8)

Fig 8



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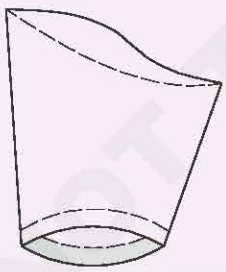
Hem is the easiest of straight sleeve finishes and is the most often used. The edge of the sleeve is folded to the wrong side along the hemline and usually hand stitched to the inside of the sleeve. (Fig 9)

Fig 9



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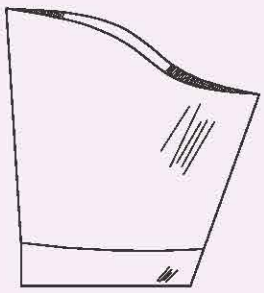
Turn-up facing is prepared by cutting out a strip of material (width equal to twice the finished width plus seam allowance). The length will be equal to lower arm measurement plus seam allowance. The ends of the facing pieces are either joined to form a circle before they are attached to the sleeve or the facing is attached and turned up before the underarm seam is stitched. Then the facing piece are stitched to the lower edge of the sleeve on the right side and folded over to the inside of the sleeve and stitched by machine. Then the under arm seam is finished. (Fig 10)

Fig 10



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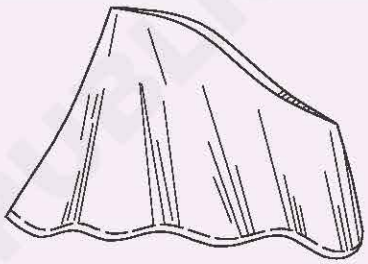
Finish with bias binding is mainly used on a circular or bell sleeve. The sleeve end is finished with a 2 cm wide bias strip of fabric. Then it is stitched and hemmed to the inside of the sleeve using slipstitch. (Fig 11)

Fig 11



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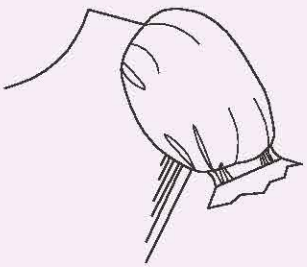
The binding can have decorative feature by using a contrasting fabric.

**Finishing with elastic:** After finishing the lower edge by hemming, attach the 1.5 cm wide tape or strip of thin fabric on the wrong side of the sleeve (2 cm above the hem). Thus a casing is formed through which an elastic is inserted and the sleeve is gathered to get a frill effect. Therefore length of the elastic should be slightly less than the finished circumference of the sleeve hem. (Fig 12) The other way of finishing at the lower end is with a cuff. Cuffs are of different shapes and widths. (Ref. Ex.No.42)

Fig 12



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# Cuffs

**Objectives:** At the end of this lesson you shall be able to

- **name and distinguish between different plackets**
- **explain the features of different types of cuffs.**

**The cuff** is a fabric band at the bottom of the sleeve. The cuff types vary according to the garments. The two main classification of the cuffs are

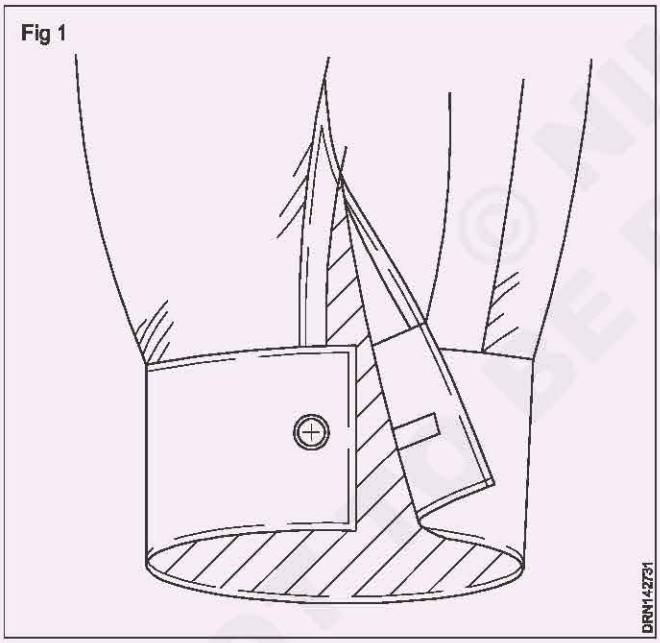
- with plackets
- cuffs without plackets Cuffs with plackets - It is a placket opening that helps a long sleeve fit snugly around the wrist. The sleeve ends are finished either with continuous bound placket, shirt placket or with faced placket.

The three most popular styles of cuffs are

- Lapped cuff
- Shirt cuff
- French cuff

The lapped cuff (normally made with a continuous bound placket) has one edge projecting from the placket edge. This provides the required overlap for the button at the cuff. (Fig 1)

Fig 1




The shirt cuff is sewn with its edges aligned to the underlap and overlap edges of the shirt placket. This cuff is normally constructed with a shirt placket. (Fig.2)

French cuff is stitched similarly as the shirt cuff, the only difference between these cuffs is French cuff is cut wide so as to fold back onto itself. When the cuff open is made with faced placket the cuff edges of French cuff are sewn to the placket so that the cuff ends meet and not overlap. The cuff is closed with cuff link (Fig 3)

**Cuffs without plackets** - This type of cuffs are used in long but loosely fitted sleeves, which are finished without placket opening. There are three basic types of cuffs stitched without plackets

Fig 2

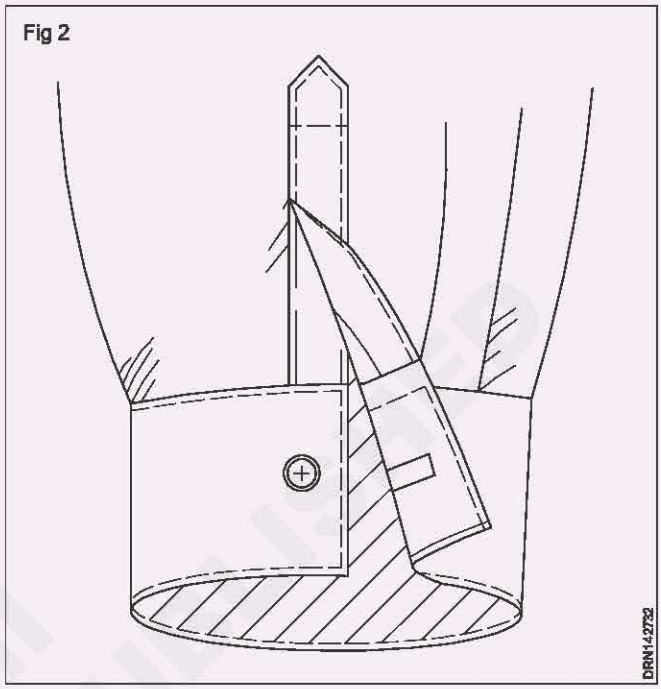
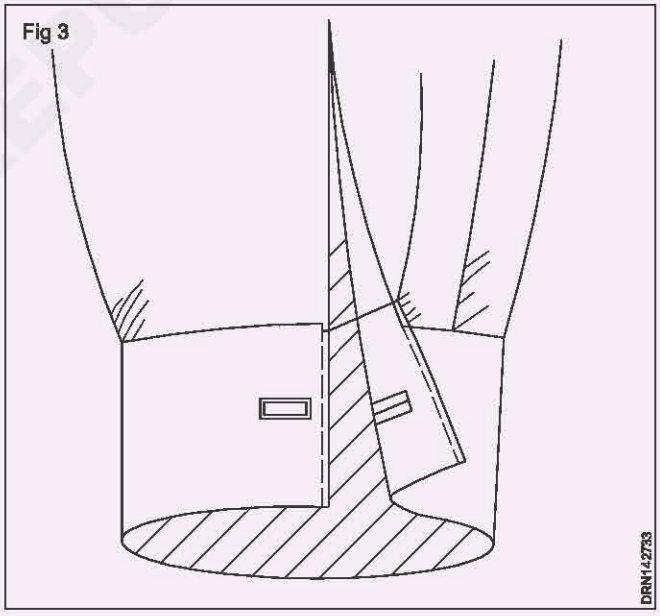



Fig 3




- Band cuff
- Straight turn back cuff
- Shaped turn back cuff

Band cuff is a separate piece of cuff material of required width stitched to the pleated or gathered sleeve hem. Either it is cut as two seperate pieces or a single piece of width double the required measure. One end of the cuff is sewn to the sleeve hem at the right sides and the other end is turned back inside to finish with heming at the sleeve hem line ( Fig 4 )

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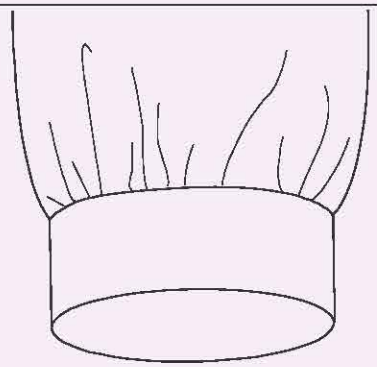
Fig 4



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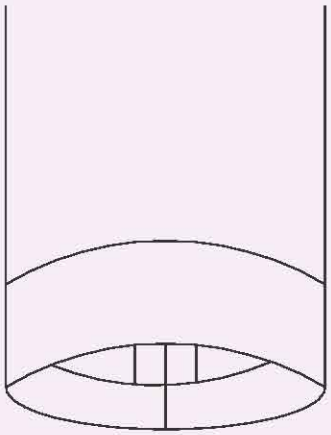
**Straight turn back cuff** is stitched by folding up the deep finished hem of the sleeve. The sleeve cuff is folded along the hem line to the wrong side of the sleeve and turned back up at the sleeve right sides with a stitch at the turnback line (Fig 5)

Fig 5



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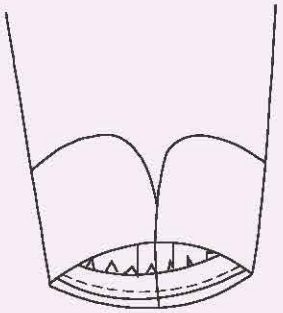
**Shaped turn back cuff** is stitched with a seperate cuff piece. The cuff is cut in required shape (i-e) either with sharp or curved cuff edges. Two cuff pieces are cut & finished separately. It is joined to the sleeve hem at the right side with a facing (Fig 6)

Fig 6



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# Trims

**Objective:** At the end of this lesson you should be able to
- **describe different types of trimming materials and accessories.**

**Trimming** is an ornamental element used on garments. Different from other decorative elements like pleats, tucks etc., a trim is always attached separately after stitching the dress. It can change the impression of a dress immensely. Trimming attracts the attention and often creates a more romantic look. It is used in both Sewing Technology and home decoration.

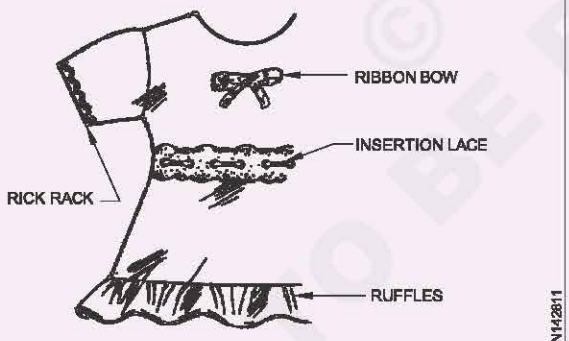
Trimming can also be used to hide small defects in the fabric.

Trimming can be distinguished into two groups readymade and self made.

**Lace** is made of cotton, silk or nylon with different designs and colour. Its width is usually from 2 cm to 25 cm or even more. It is like an embroidery tape. It is commonly used on the neckline, sleeve hem, yoke line, garment hem, etc. It can also be gathered to give a frilled effect.

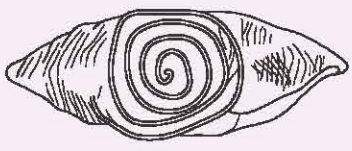
**Rickrack** is made in cotton or polyester, it is available in different colours and is of narrow width. Rickrack is often used to make designs. (Fig 1)

Fig 1



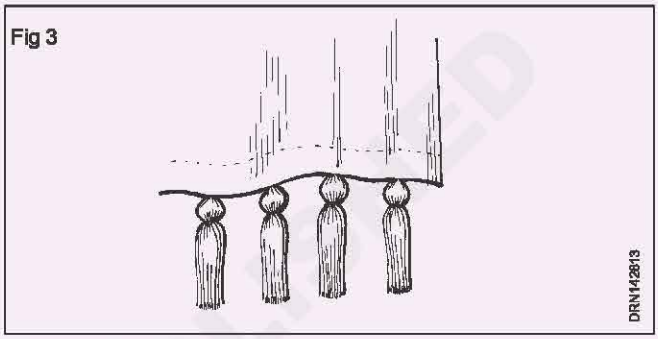

**Ribbons** are made of satin, taffeta or nylon of different colours and different width. Ribbon bows are often used as decoration for bridal wear and children's clothing. Ribbons of different width can be made into rose or other floral shape. These can be stitched from wrong side at the back so that no stitching is visible from the right side. (Fig 2)

Fig 2



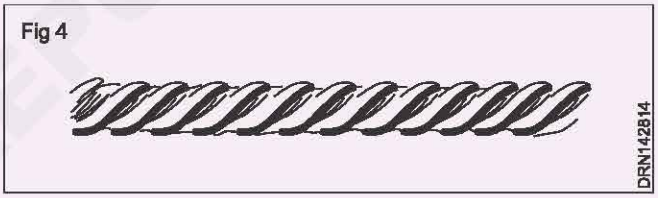

**Tassels** are made of strings of silk, cotton, wool, nylon, etc. They are also available in different widths and colours. Contrast coloured, embroidered tassels are also available. They are mostly used on saree palls or on duppattas. (Fig 3)

Fig 3



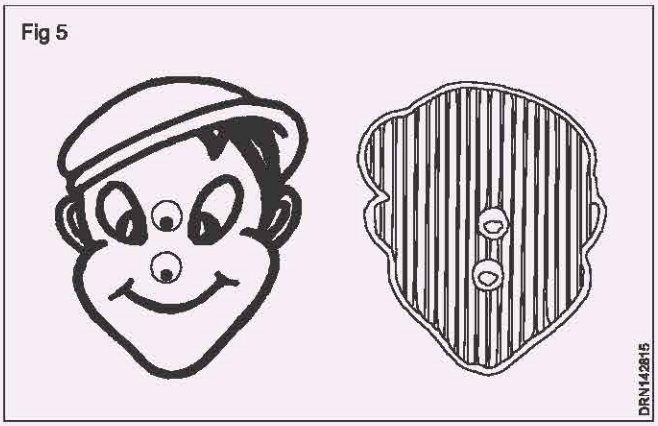

**Rope or Cord** of various colours and designs made of silk and cotton are available. These are used as belts in night suits and frocks. (Fig 4)

Fig 4




**Fancy buttons** depicting fruits or animals etc can also be used as trimming. (Fig 5)

Fig 5




**Motifs** are available as readymade or self-made. A piece of cloth is cut into different shapes and the edges are finished with embroidery stitches. Such motifs are also used as decorative patches mainly in children's garments. Self-made trimmings are made by hand. For example,

**Bias trimmings:** Bias binding in contrasting material or self fabric can be used to finish necklines, openings and hems in garments. (Ref. Ex.19 & 29)

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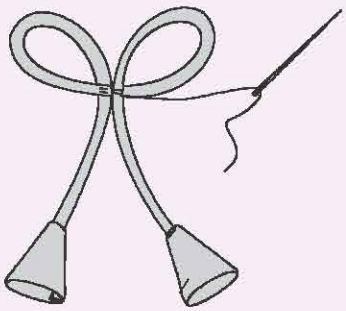
Bias tubing can be used for making decorative button loops, motifs of different shapes etc. The shape can be drawn on the garment and then tubing is tacked accordingly on to the garment along the marked line. Several layers of bias tubing can be made into a decorative belt. This may be of self or of contrasting material (Fig 6).

Frills are also used as a trim. They can be applied on the edges or in between the dresses. It adds weight to the part where it is applied. So it helps in the flow of the garment.

Embroidery is another good method of applying decoration. Some of the simple embroidery stitches can be used on a design or the garment itself or a motif can be made and attached. In the same way smocking or applique can also be used as trimming.

Fig 6



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## Trimmings (fixing of buttons, hooks)

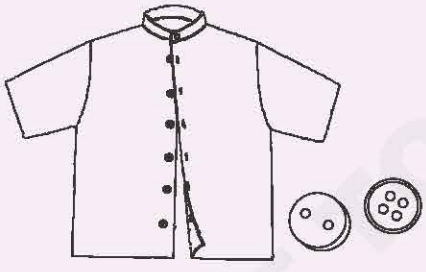
**Objective:** At the end of this lesson you shall be able to

- **name the different types of fasteners, their features and applications.**

There are various types of fasteners. Some are decorative and some others are meant to be conspicuous. The common fasteners are buttons, press studs, zips, velcro strips, hooks and eyes, buckles and clasps etc. Fasteners are used in garments, bags, purse, suitcase cover etc.

Buttons are of different types. They are made of plastic, nylon, metal, leather, wood, pearl, ivory etc. They may be round, elongated, oval etc. Buttons are fixed either by hand stitching or machine stitching. They are mainly used in body garments. Buttons are basically of two types: shank and sew-through. Sew-through button has either two or four holes through which the button is sewn on. (Fig 1)

Fig 1

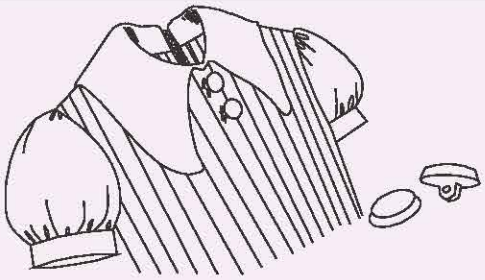


BUTTONS

DRN142811

Shank button is provided with shank beneath through which it can be fixed. It is often used in ladies' tops and kids' garments, mostly for decorative purpose or in heavy garments like coat or uniforms. (Fig 2)

Fig 2



SHANK BUTTONS

DRN142812

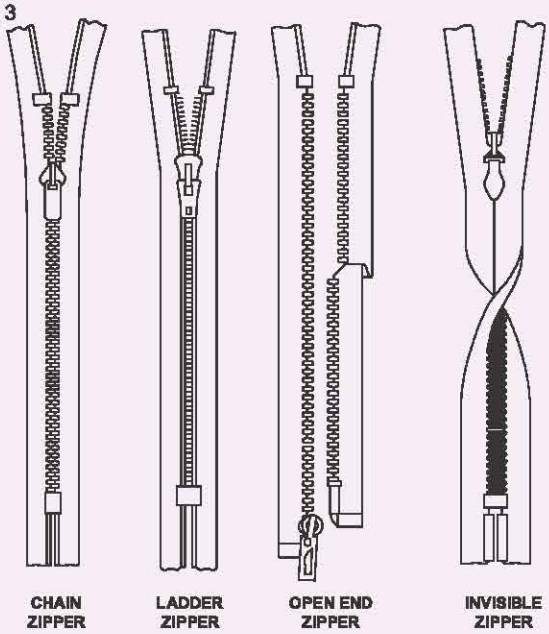
Zip fastener is the most important fastening accessory. Varieties of zippers are available like chain zipper (invisible zipper), ladder zippers and open-end zippers. For light weight and fine fabric plastic zippers and for heavy weight fabric metal zippers are used.

Single and open end zippers are used for sportswear, jackets and on garments with completely open front (Fig 3).

Zippers are fixed by machine. A special attachment is used. The presser of a machine is replaced by the zipper presser foot (Fig 4).

**Velcro** fastening has two surfaces, one surface is covered with small nylon hooks and the other surface with loops. It is easy to fasten and therefore mainly used in children's wear. (Fig 5)

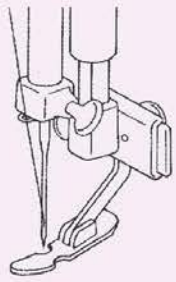
Fig 3



CHAIN ZIPPER | LADDER ZIPPER | OPEN END ZIPPER | INVISIBLE ZIPPER

DRN142813

Fig 4



ZIPPER FOOT

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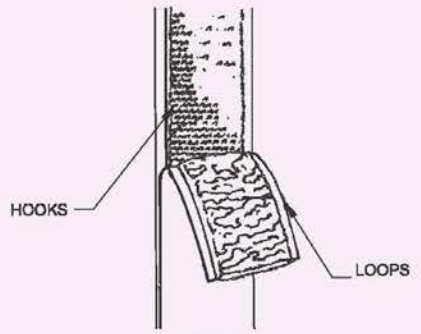
Fig 5

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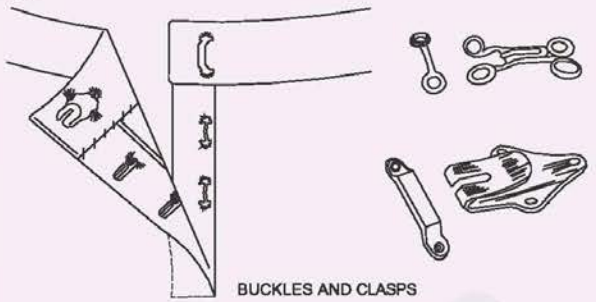
Hooks and eyes are available in wide range of sizes and types. They are used in trousers and ladies' garments.

Buckles and clasps are made of metal or plastic. They are used in belts suspenders. (Fig 6)

Fig 6



BUCKLES AND CLASPS

DRN142916

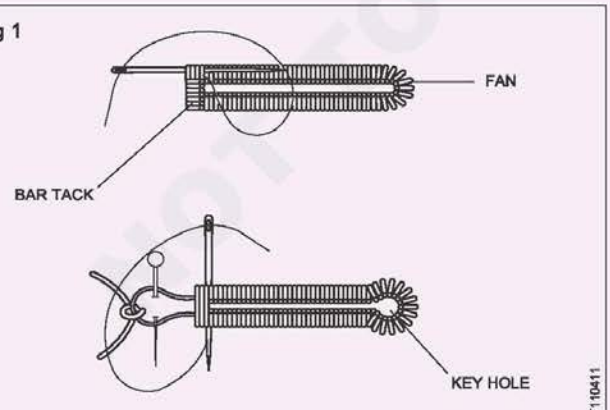
## Types of buttonholes

**Objectives:** At the end of this lesson you shall be able to

- **list the types of buttonholes and name their features.**

Buttonholes are created as one of the last steps in stitching garments. In ladies' garments the buttonholes are worked on the **right-hand side**. But in gents garments, they are worked on the **left-hand side**. In side plackets, the buttonholes are always worked in the front part. A buttonhole is constructed with 2 long sides and two ends. These ends are either finished by **bar tacks** or one end is finished with a bar while the other end can have the shape of **keyhole** or a **fan**. The keyhole with its strong rounded end is suitable for coat buttons which pass through easily. (Fig 1)

Fig 1

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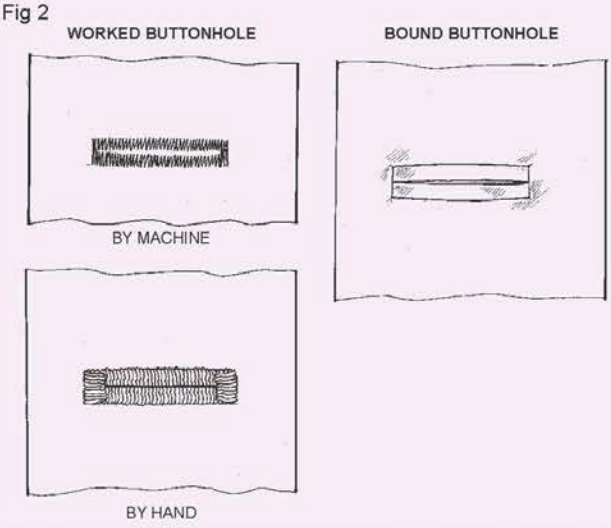
**Bound buttonholes** are worked with machine by stitching strips or patches on the location of the buttonhole. The strips or patches are fixed on the right side and finished on the wrong side, thus the binding edge is seen on the right side. They are not suited for delicate fabrics. Worked buttonholes can be worked either by hand or by machine. Hand worked buttonholes are slashed first and then stitched. But machine worked buttonholes are stitched first and then slashed. Hand worked buttonholes are stronger than the machine worked buttonholes but take more time. (Fig 2)

Fig 2

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**Corded buttonholes** are prepared by machine with a corded bias strip used for buttonhole lips or by hand using a cord as a filler below the single stitch. The cord produces soft, rounded edges suitable for spongy fabrics such as knits etc. (Fig 3)

**Dimension of the buttonhole** can either be calculated (diameter of the button + it's height) or tried out by cutting a slit in a scrap of fabric and by adjusting the length until the button slips through easily. (Fig 4)

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Fig 3

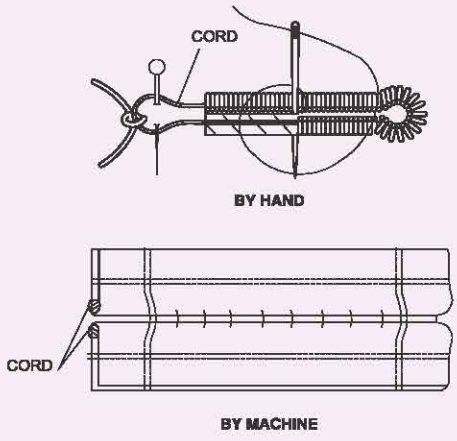



Fig 4

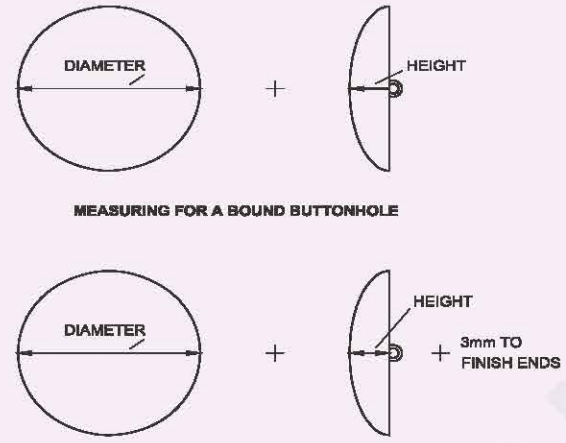



Fig 1

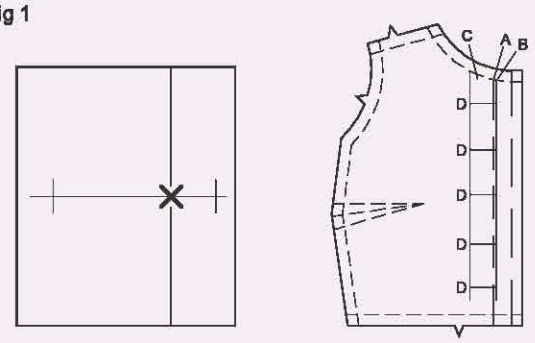
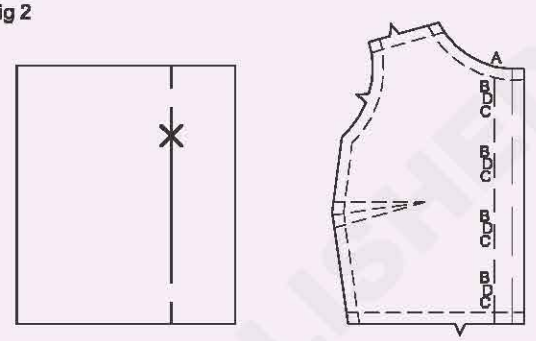



Fig 2




## Marking position of Buttonholes -

Button holes are always marked in relation to the button placement line, which is always in according to the centre line of the garment.

The three key placement points for the button holes are Neck, the fullest part of the bust and the waist. Additional button holes are evenly placed in between these points. The lowest button hole must always be above bulk of hem.

Horizontal Button Holes are placed to extend 3 mm beyond the button placement line.Line A is the button placement line of the garment.. B is 3 mm from button placement line . Line C is at a distance of buttonhole length. D marks the centre of the button hole.

Vertical buttonholes are marked 3mm above the mark for centre of button. The markings for vertical buttonholes are placed directly on the button position line A. The marking B and C is the length of buttonhole. Pont B is 3mm above the mark for the centre of the button. D is the button hole marking.

There are three types of Button holes in consideration with Bar & Fan

1 One Bar & one Fan (Standard)

2 Two Bar ( Mostly machine made)

3 Two Fan (Fitted Ladies Garment)

**The button placement line must be marked on each half of the garment to make it convenient to mark button hole position and for checking that both the centre lines will match when the garment is closed.**

**Button holes in women garments - placed on the right hand side of the front open garments and on the left hand side of the back open garments.**

**In fitted garments Buttonholes are horizontal and in loose garments Buttonholes are vertical**

**The space between finished edge of garment and button position line must be three-quarters to the diameter of the button.**

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# Darning and patching

**Objectives:** At the end of this lesson you shall be able to
- **explain the two methods of mending**
- **name the basic rules for darning**
- **name the feature of the darning needles**
- **name the feature of stain and its treatments.**

**Mending** is the method of repairing damage caused by the wear and tear of use or accident. The most satisfactory methods of mending garments are darning and patching.

Strengthening or replacing of the worn and broken threads or yarn of fabric, by working into the weave or knit of the fabric is called darning.

Filling in with new stuff in place, where the torn or worn out of a garment is too much to bear darning is called patching.

There are needles specially made for darning with elongated eyes to receive the loosely twisted strands of darning thread used for this purpose. (Fig 1)

Fig 1

**Basic rules for darning:** Darning should be inconspicuous and hence the thread used for darning should be the same as the original fabric or similar to it in colour or texture. The best method is to ravel out yarn from seam or hem of the garment, which is to be darned. Use warp threads raveled out from side seams for lengthwise darning and filling threads from the hem for the crosswise darning.

- The needle used for darning should be long and fine.
- If the tear is large or if its edges are fraying, keep a piece of thin material on the wrong side under the tear and darn through both layers of the fabric.
- Small running stitches spaced to resemble the weave of the fabric should be worked.
- You should leave a loop of thread at the end of the first and subsequent rows to allow for shrinkage in the wash and elasticity in wear.
- Do not begin darning with a knot; instead leave thread end of about 22 cm length on the under side of the work.
- Work should be done far enough from tear so that mend will not pull out.

The damage in a fabric normally has the shape of a hole or a cut. The shape of a cut/tear can be as follows:

Straight tear is a tear or cut along a straight thread – either warp or weft.

In diagonal tear both the warp and weft yarns are cut and so it is necessary to work running stitches parallel to both sets of threads. Stitches should be alternated over and under the tear as in darning a straight tear. First darn in lengthwise and then widthwise direction.

Three-cornered tear is the common 'L' shaped right angle tear. Darning follows the same method as in the straight cut, but the stitches are overlapping on the corner to give more strength on it.

If the damage is in the shape of a hole, the plain weave hand darn is done. First trim the ends and ragged edges. Then darn in lengthwise direction and in widthwise direction so as to produce a plain weave darn over the hole.

Darning of small holes and tears can also be done by machine by following the same general principles as for hand darning. However machine darning is more conspicious and less neat. With a straight stitch, machine darning is done. If you have a zigzag machine, darning involves making a series of zigzag stitches over the area to be darned. To stretch the material evenly, an embroidery needle plate can be fixed. (Fig 2)

Patching is a type of mending where in the place of a tear or hole, an additional piece of fabric of the same kind is inserted and stitched. For repairing a big hole, patching is more suitable than darning. It is stronger and can stand more wear and tear in laundering.

In order to make the work inconspicious, the patch should be of the same material as the garment and it's grain should match the design perfectly. If the garment is faded, cut the material for patching from some hidden part of the same garment itself. If new material is to be used, wash it with soap and dry it in the sun.

Patches can be attached from the wrong side of the garment (hemmed or plain patch) or from the right side. The difference in plain or hemmed patch is the finishing of the seam allowance.

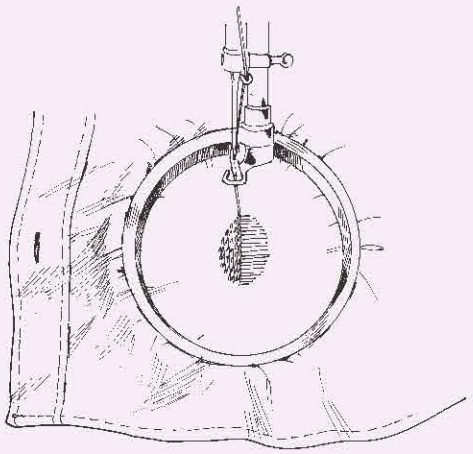
In plain patch, the seam allowances are pressed open and the raw edges are finished with overcasting. In hemmed patch, the seam allowance should be larger

(2 more) on all sides so that they can be folded and hemmed to the garment fabric.

Patches can also be attached from the right side of the garment : the ragged edges of the hole in a garment are cleaned well. The patch is atleast 1.5 cm larger all around than the hole. The patch is attached to the fabric with dummy stitches. Working from right side, neaten all around the raw edges with close zig zag machine stitch.

Decorative patches are also stitched on the right side of the garment. Since they have decorative purpose they are of different material than the garment according to the task. They can also be embroidered. They are often used in children's wear but also in adults' dresses.

Fig 2



DRN143012

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# Drafting and developing for ladies suit

**Objectives:** At the end of this lesson you shall be able to
- **sketch different types of short kurties**
- **Draft a short kurties.**

Fig 1

DRN153111

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**Measurements**

Full length = 105 cm

Natural waist = 39 cm

Bust level = 25.5 cm

Shoulder = 38 cm

Bust = 92 cm

Waist = 72 cm

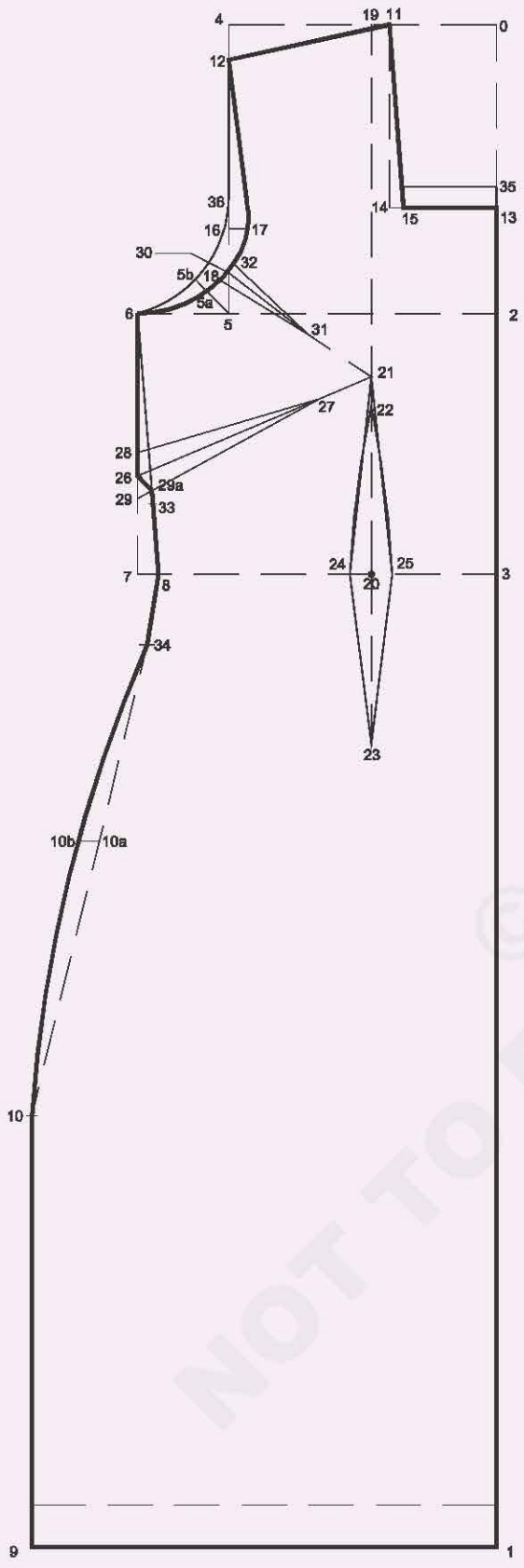
Hip = 100 cm

Sleeve length = 25 cm

**Material**

2.60 x 0.90 m Poplin/Terycot

Fig 2




FRONT & BACK

## INSTRUCTIONS FOR DRAFTING

### Front

| | |
|---|---|
| | Square out horizontally and vertically from 0 |
| 0-1 = FL + 3 cm (for dart) | |
| 0-2 = B/4 - 2.5 cm | |
| 0-3 = NW | Square out from 2, 3 and 1 |
| 0-4 = Sh/2 | Square down from 4 & mark 5 |
| 2-6 = B/4 + 2.5 cm | Square down from 6, mark 7 |
| 7-8 = 1.5 cm | Join 6-8 |
| 1-9 = B/4 + 10 cm | Square up from 9 |
| 9-10 = B/3 | Join 10-8 |
| 10-10a = 1/2 of 8-10 | |
| 10a-10b = 1 cm | Shape 8-10b-10 |
| 0-11 = B/12 | |
| 4-12 = B/36 | Join 11-12 and square out from 13 |
| 0-13 = B/8 + 1.5 cm | Square down from 11 and mark 14 |
| 14-15 = 1 cm | Join 11-15 |
| 5-16 = 1/3 of 12-5 | Square out from 16 |
| 16-17 = 1.25 cm | Join 12-17 |
| | Divide angle 16-5-6 |
| 5-5a = 1/3 of 6-5 | Shape 12-17-5a-6 |
| 5-18 = 2 cm | |
| 0-19 = 3-20 = B/12 + 1.25 cm | Join 19-20 |
| | Square up and down from 20 |
| 19-21 = BL | |
| 21-22 = 2 cm | |
| 20-23 = 20-22 | |
| 20-24 = 20-25 = 1.5 cm | Shape slightly 22-24 and 22-25 |
| | Join 24-23 and 25-23 |
| 6-26 = B/8 | Join 26-21 |
| 21-27 = 4 cm | Join 26-27 |
| 26-28 = 26-29 = 1.5 cm | Join 28-27, 27-29 and mark 29a, join 26-29a |
| 18-30 = 0.75 cm | Join 30-21 |
| 30-31 = B/12 - 1 cm | |
| 30-32 = 0.75 cm | Join 31-32 and 31-18 and extend up to shape of armhole |
| 8-33 = 8-34 = B/12 | Mark for placket opening |

**Note: Addition of 3 cm in full length is given for side dart. It is not required for back length. Take only full length for back.**

### Back

| | |
|---|---|
| | Outlines are same as front |
| 0-35 = B/8 | Square out from 35 upto previous neck line |
| 12-36 = 1/2 of 12-5 | Divide angle 36-5-6 |
| 5-5b = 1/2 of 5-6 | Shape 12-36-5b-6 (back arm hole) |
| | For centre dart at back: |
| | Join 21-20 |
| | Join 21-24, 21-25, 25-23, 24-23 (back dart) |

**Note: Skye dart and side dart are not required.**

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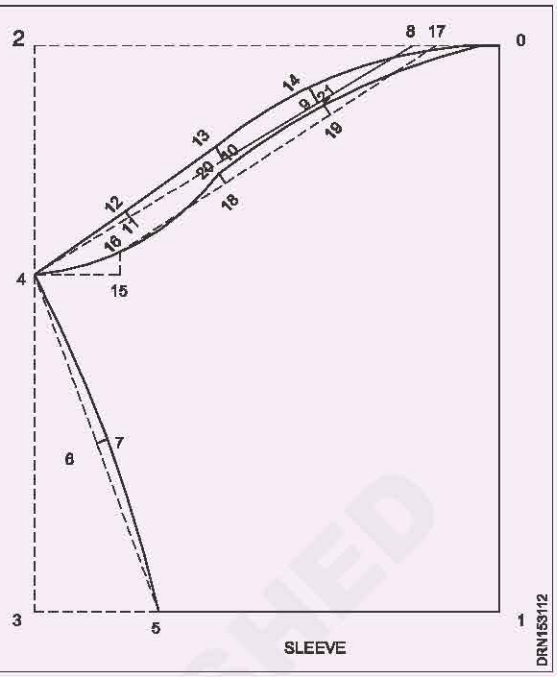
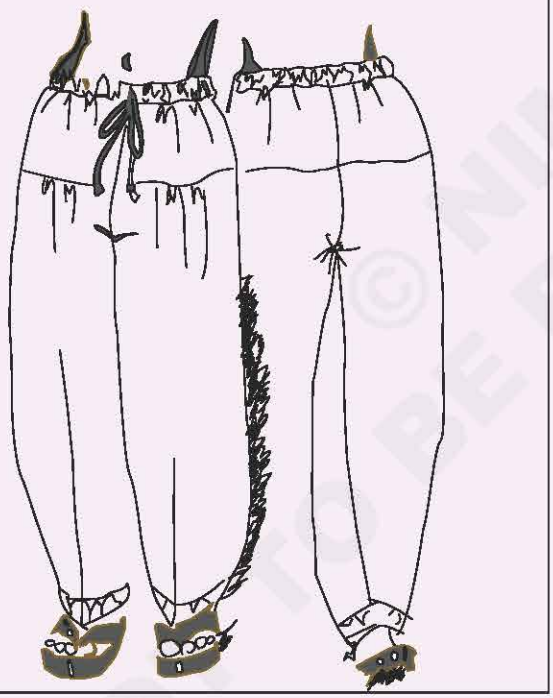
**Sleeve**

| | |
|---|---|
| | Square out horizontally and vertically from 0 |
| 0-1 = SL | Square out from 1 |
| 0-2 = B/4 - 2.5 cm | Square down from 2 and mark 3 |
| 2-4 = B/12 + 2.5 cm | |
| 1-5 = SB/2 | Join 4-5 |
| 4-6 = 1/2 of 4-5 | Square up to 6 |
| 6-7 = 0.5 cm | Shape 4-7-5 |
| 0-8 = B/24 | Join 4-8 divide into 4 equal parts<br>mark 9,10,11 and square up |
| 11-12 = 0.3 cm | |
| 10-13 = 0.7 cm | |
| 9-14 = 0.8 cm | Shape 0-14-13-12-4 (back shape) |
| 4-15 = B/24 | |
| 15-16 = 1 cm | |
| 8-17 = 1 cm | Join 16-17<br>Divide into three equal parts mark point 18,19, square up |
| 18-20 = 0.5 cm | |
| 19-21 = 0.5 cm | Shape 0-21-20-16-4 |




3 hooks

Fig 3



## Draft and cut a salwar

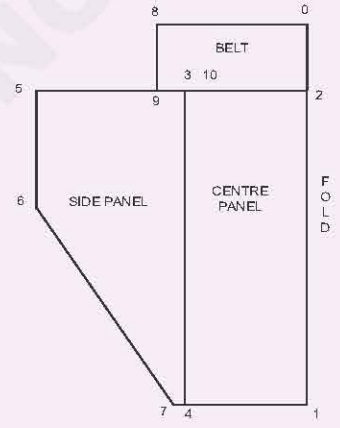
### Material

2.46 x 0.90 m poplin/terycot

### Measurements

| | |
|---|---|
| Full length | = 100 cm |
| Hip | = 100 cm |
| Bottom | = 38 cm |

1 Lay the brown sheet on the drafting table.
2 Draw the drafting of side panel and centre panel of salwar with waistband on the brown sheet, using measuring tape and L square. (Fig 4)




0-1 = FL

0-2 = H/4-5 CM

2-3 = 1-4 = H/6

3-5=width of cloth/2-2cm

5-6=h/3+5-belt

1-7=Bottom/2

0-8=2-9=H+8cm/4

2-10=1/2 of 2-9

Square out horizontally and verticaly from 0

Square out from 1 and 2

Square down from 5

Join 6 - 7

For unbelted salwar panels must be extended up to waistline

Marks for gathering in front

DRN153144

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# Salwar

**Objectives:** At the end of this lesson you shall be able to

- **explain the different features of salwar**
- **describe the kali piece attachment.**

**Salwar** is a **unise ower** garment. It is a loose fitting wear, worn in combination with either kameez or kurtha. It is a leg garment providing a lot of room by panels and gathers in front and back. It tapers down to the bottom to a narrow width at the ankles. Because of the width it is traditionally stitched from fine fabrics. The bottom cuff shows decorative stitches, as this portion is visible while most of the upper portion is covered by the kameez. Waistline of salwar is finished with casing for inserting cloth tape.

Style variations in salwar is brought with certain modifications at its ( Fig 1)

- Waist piece
- Kali piece

Fig 1

**Waist piece :-** To achieve a less bulky effect the salwar can be designed with a broad yoke at the hipline, this is also called as waistpiece or waist band / belt. The gathers are given on the lower edge of the yoke line. Salwar is also prepared with was it piece, where it is very loose at the waist and seat. Looseness of the garment depends on wearers' taste.

**Kali piece :-** Salwar is either prepared with two leg pieces, one on either side or with six leg pieces, three on either sides. Among the three the two side pieces are known as kali pieces, it is joined together with a centre piece at their middle to form a leg piece ( Fig 2). The introduction of kali piece gives to the garment will give looseness to the garment with less fabric consumption. Even salwar with waist band is also stitched with kali pieces now - a - days.

**The style features of Salwar selected for stitching**

- Waist belt
- Gathered front and back
- Decorated bottom finish

**The material required for stitching a salwar**

2 length + 10cm

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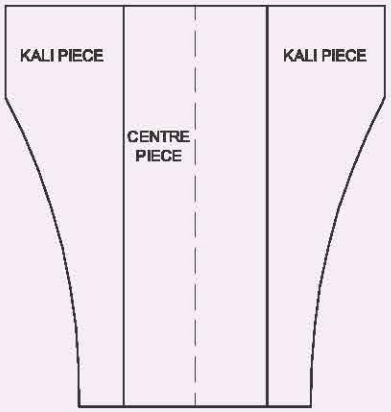
Fig 2



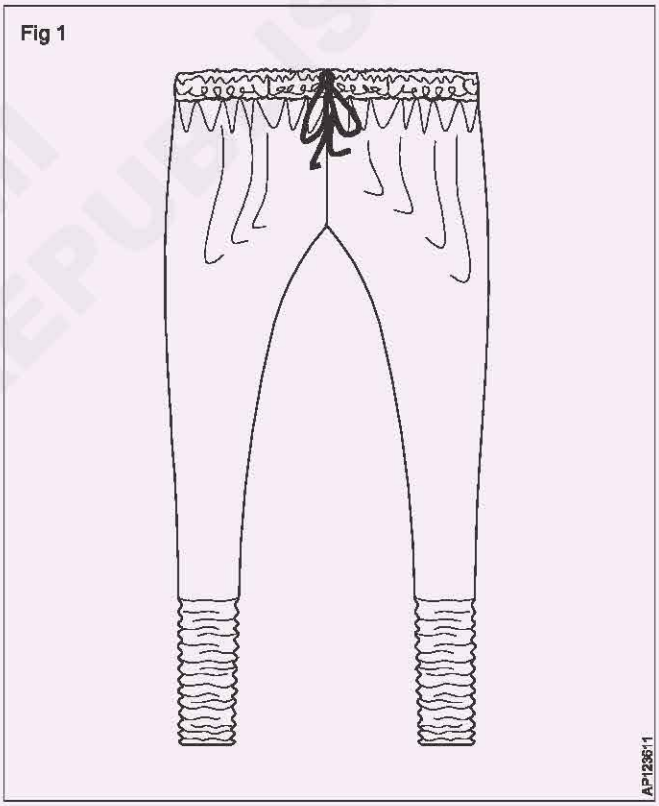

## Churidar

**Objectives:** At the end of this lesson you shall be able to

- **explain the features of churidar**

**Churidhar** also known as surwar is a popular variety of pyjama worn by both men and women. It is a leg garment providing a lot of room up to the knee line and is shaped to a very tight fit up to the ankle. It narrows more quickly, so that contours of the leg are revealed. It is cut on bias to provide some stretchability required along with the tight fit. The garment is cut longer than the leg length, to form a special feature the "churis" (hindi :bangles), folds which are set from calf to ankle. The churidar can also be designed with a belt, similar to that of a salwar. It is always finished with a bottom opening (10cm). Churidar is stitched with casing at the waist for inserting the tape. It is worn with kameez, punjabi kurtha, Jodhpur coat, sherwani etc. Unlike salwar, the upper portion of garment (waist) is not wide spread, it is 10 - 14cm loose to the hip measurements. Material like cotton, poplin,khadi are suitable for stitching churidar.

Fig 1




The garment is cut on bias material to get a nice fit below knee. For this, either bias bag is prepared or it is cut on plain material. Sometimes the inner leg length of the garment is finished with taped seam to give a firm stitching as it is worn tightly fitted (Fig 1)

**The style features of churidar selected for stitching**

- Bias bag
- Gathers at bottom
- Tapped seam at inside leg finish

**The material required for stitching a churidar**

2 Length + 25cm

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# Kameez

**Objectives:** At the end of this lesson you shall be able to

- **explain the different style features of kameez**
- **describe the decorative sleeve types and neck designs suitable for kameez.**

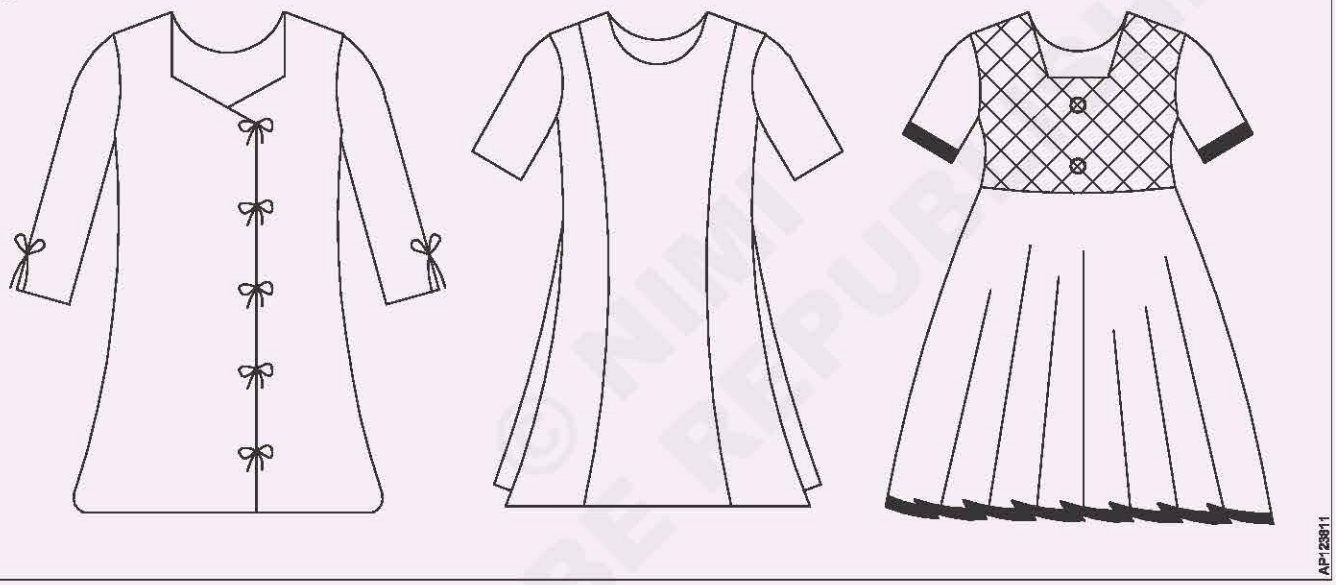
**Kameez** is refered to as kamiz or qamiz. It is also known as ladies shirt. It is a body garment. Its full length can vary between above knee to the lower calf. The length / design varies with the fashion scenario. It can be fitted or flared as the fashion demands. Slits are normally provided on both side seams from mid thigh to bottom line. The sleeve can be of any length. The kameez can be clubbed with a salwar or churidar. A long and broad shawl called dupatta is worn along with it. All three components (salwar,kameez,dupatta) should match or compliment each other in colour or design or both of it.

The kameez has evolved tremendously from the traditional style which usually consisted of a long dress with long sleeves. They now come in a variety of styles and designs, having been influenced by popular designers all over the world.

The style variations in kameez may be brought with modifications in (fig 1)

- Bodice
- Length
- Dart

Fig 1




- Sleeve
- Open
- Neck design
- Trimmings

**Bodice** - The garment style is mainly reffered by its bodice type. The front and back bodice which are cut into either four or six panels and stitched into a kameez is a princess line kameez. When it is stitched with yoke part and circular bodice it is known as umbrella kameez. The length of yoke may vary according to taste. The garment is also prepared with overlapping bodice part (normally left side) in overlap kameez. (Fig 1)

**Length** is another important feature of kameez. Now -a-days, ladies started wearing short kameez with its length ranging from shoulder to knee level or just below it. Those worn with churidar are stitched with circular bodice with yoke and full length measuring more than the other kameez types (nearly just 12 - 15cms less than the height of the person - measuring from shoulder)

**Dart -** Kameez is stitched with full dart or half darts to create fullness at the front part.Usually two full darts are stitched at front part one on either sides. In some styles like punjabi kameez, the garment is prepared with armhole and waist darts along with the full darts to construct a tightly fitted garment.

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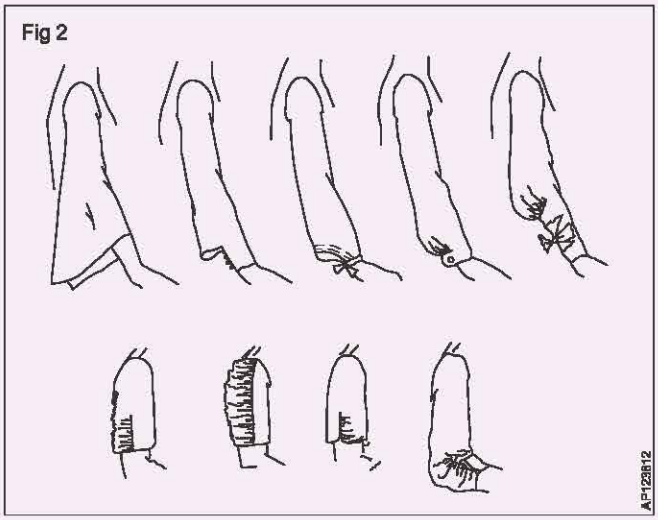
**Sleeve -** The kameez is either stitched with or without sleeves. The sleeve length may vary according to the taste. It may be magyar sleeves short sleeve, 3 /4th sleeves or full sleeves. It may also be constructed with certain details to suit the style of the kameez if required. (Fig 2)

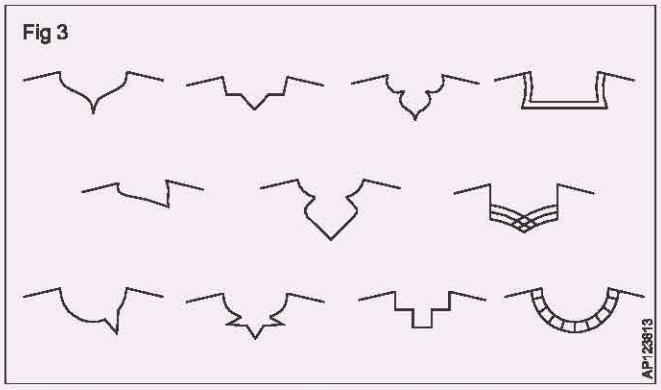
Fig 2




**Open** - The kameez is prepared without open when stitched with required front and back neck depth for easy put on and take off the garment. When the garment is constructed in tight fitted style, the zipper placket is introduced at the centre back. In certain styles like overlapping kameez it is prepared with front half open (10cm) which is finished with two placket and fastened either with hooks & eyes or fancy buttons.

**Neck designs -** Wide variety and patterns of neck designs are applicable for kameez.The neckline is finished with facing or piping.It is selected to suit the fabric and the garment style choosen. (Fig 3)

Fig 3




**Trimmings** like lace, ribbons, braids, beads etc are suitable for enhancing the beauty of kameez.The garment is worked with trims in the neckline, bottom, hem, sleeve hem, side slit etc. Trimmings like beads, flowers are even worked all over the garment to give rich look to the garment.

**The style features of Kameez selected for stitching**

- Front part with skye dart, side dart and waist dart.
- Back part with waist dart.
- Faced neck finish
- Side slit

**The material required for stitching a kameez**

2 Length + 1 sleeve + 10cm

**Ladies' suit**

If the body and leg garment are sewn in a same fabric, then it is called as "Suit" and then the fabric used for that is called as "Suiting fabric". Salwaar kameez, churidhar kurtha are the examples of ladies' suit.

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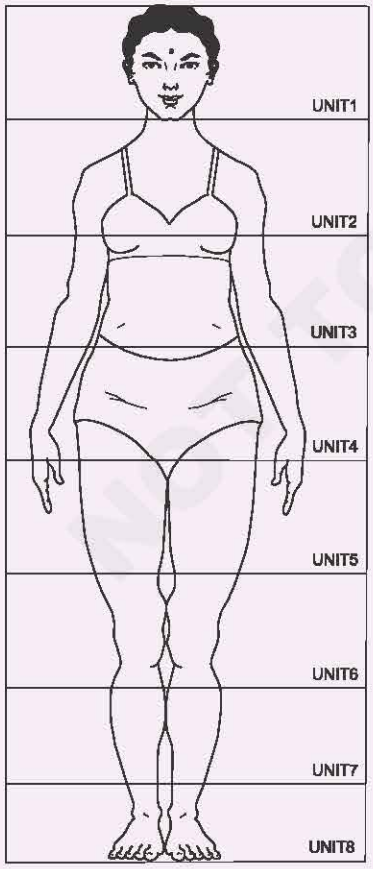
## Proportions of human body

**Objectives:** At the end of this lesson you shall be able to
- **explain the proportions in human body with the help of the eight-head theory**
- **explain about body measurements their importance and types.**

The knowledge of the anatomy (shape and formation) of the body is essential for the construction of a garment. And although every human figure is of individual, i.e. different shape some general proportions are similar in almost every figure. The eight-head-theory is a helpful system which describes some ideal proportions of a human figure. According to this theory the body is divided into eight equal parts. The size of the head-height is the measure for all the other units.

Unit 1 hair to chin
Unit 2 chin to nipple
Unit 3 nipple to navel
Unit 4 navel to public organ
Unit 5 public organ to mid thigh
Unit 6 mid thigh to below the knee
Unit 7 below the knee to above the ankle
Unit 8 above the ankle to toe (Fig 1)

Fig 1




Actually the total human height is compared to 7 ½ heads but for easy calculation the height is taken from hair to the foot standing tip toe, thus making eight equal parts.

Further, proportions of the body can be described as such when a person stands and stretches the arms horizontally, the measurement taken from one middle finger tip to the other middle finger tip is equal to the whole height of the body. Half the length of the arm locates the position of the elbow. Half the width of back is equal to one fifth of the chest measure. The shoulder measured from one end to the other is equal to half the chest measurement. The elbow line falls on the waist line.

In garment construction this means, that only a few measurements have to be calculated on the basis of such proportions. But this method is only valid for proportionate figures.

**Proportionate figures of men and women:** Same proportions generally differ in men's and women's bodies. The following main different features are valid for the women's body:

– less body height
– less shoulder width and narrower chest (thorax)
– larger hip
– limbs more delicate
– torso a little bit longer
– softer forms.

**Bones, joints and their movement:** The human body is made up of bones and muscles. From childhood both - bones and muscles - develop until the body reaches maturity. After maturity the bony structure will not have any growth but the muscles may undergo many changes, in particular chest, waist and seat. Lack of proper nourishment, overfeeding sportive activities etc. may change the shape of the body.

The joints between the bones which enable for easy movement of the body are of different structure:

Gliding joints are found in spine, ankle and wrist. These joints are having qualities of rotation and they rotate to some extent.

Ball and socket joints are formed in the top of the thigh bone and shoulder. These bones rotate very easily and have a maximum rotation.

Hinge joints are of two types. The first type can move forward only (elbow) and the second type can move only to the back (knee).

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The knowledge of joints and their movement make the dressmaker understand the requirements of ease to be allowed at different parts of a garment.

While constructing a garment tolerance must be given in pattern. Tolerance means the extra loose or ease compared to the actual measurement taken from the body. In ladies' shirt for example the chest measurement might be 80 cm, but the chest measurement for the garment will be 85 cm. The difference of 5 cm will be known as tolerance which is required for the movement. Tolerance should not be either too much or too less, because both will spoil the shape of the garment. Therefore the tolerance depends on the style of the garment.

## Types of figures (abnormal figure)

**Objective:** At the end of this lesson you shall be able to
- **explain different types of figure and their remedy.**

No man can be a successful cutter unless he is an observer of the human figure. Make a habit of observation of various types of person you meet in the routine life, some people have different types of body structure during birth by accident or by virtue of this occupation, if the degree of deformity is judged only by comparing with the normal figure.

Normal figures are proportion to width and height without any deforming. According to Indian standard figure measurement for ladies and gents are:

| | Height | Chest | Waist | Hip |
|---|---|---|---|---|
| **Gents** | 5"to 6" | 36" | 32" | 40" |
| **Ladies** | 5"to 4" | 36" | 28" | 40" |

Eight head theory applies very well with normal figure only. (Fig 1)

Fig 1

NORMAL FIGURE

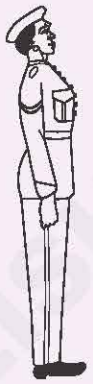
STN213321

**Abnormal Figures:** The Width and height in abnormal figures are not proportionate to each other. It has deformities.

**Erect figures:** These kinds of figures are normally seen in army or police personalities. The body is bend on the backside and straight in the front. Due to this back length is shorter than front. Across chest is more chest is round in shapes hollowance on the back blade bone can be seen in Fig 2.

**Tall and thin figure:** In this figure the height is more when compared to the width measurement is less than normal. Neck height is more, shoulder measurement can be more or equal compared to normal figure. (Fig 3)

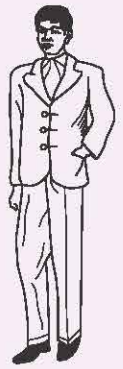
Fig 2



ERECT FIGURE

STN213322

Fig 3



TALL & THIN FIGURE

STN213323

Stooping figure: These kind of figure is bend on the front side and back slightly round shape. Front length is less. Back length is more. Across chest is less across back more compared to normal figure. It is just opposite to erect figure. (Fig 4)

Fig 4

STOOPING FIGURE

STN213324

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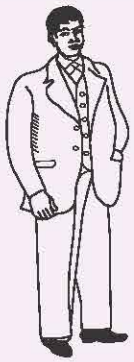
**Short and stout figure:** In this figure, width measurement is more than compared to the height. Hip is prominent, thigh are very close to each other girth measurement is lesser. Different between chest, waist and hip is lesser according to normal figure. (Fig 5)

Fig 5



SHORT & STOUT BODY

STN213325

**Sloping shoulder:** It is not parallel to chest and waist line. Shoulder slope is more, neck height look longer depth of skye is compared to normal figure. (Fig 6)

Fig 6

SLOPING&SHOULDER

STN213326

**Square shoulder:** In this figure shoulder seems to be square having less shoulder shaping, neck height look out to be short, shoulder sloping is parallel to waist and chest line. (Fig 7)

Fig 7

SQUARE SHOULDER

STN213327

**Corpulent figure:** This is due to abnormal growth in stomach area. Front length is more than back length cross back is less, waist measurement may be more than hip, neck height is smaller, across chest more. (Fig 8)

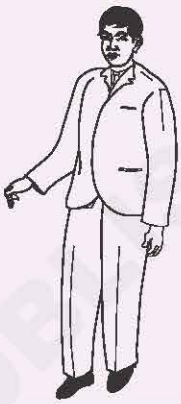
Fig 8

CORPULENT FIGURE

STN213328

**Semi corpulent figure:** In this kind of figure waist hip and chest measurement are equal. Balance of front and back is equal. No curve in waist. (Fig 9)

Fig 9



SEMI-CORPULENT FIGURE

STN213329

**Importance of measurements:**

Measurements are used

1 For correct fitting.

2 To make a record of body proportions.

3 To device the calculations of body proportions with each other.

4 To do alterations effectively.

5 To calculate the fabric requirements.

6 To prepare size chart/standard measurement chart.

7 To identify the size proportions and difference from each other.

The measurement are a time saving device only when taken accurately. This requires maximum concentration and patience throughout the measuring process. So, it is very important to take measurements for garments construction.

**Method of taking body measurements**

Measurements can be taken without assistance, but the task is easier when you have someone to help.

**Point to be considered while taking measurements**

The following important points have to be considered while taking body measurement.

1 Measurements can be taken without assistance, but the task is easier when you have someone to help.

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2 For greatest accuracy, wear under garments or a body suit when measuring; use a good quality measuring tape that does not stretch.

3 Before starting, tie a cord or string around your middle and let it roll to the natural waistline.

4 Take vertical measurements first, and then measure the girth measurements.

5 Pull the tape snug, but not too tight, always around the fullest part of each body area; be sure to keep the tape parallel to the floor.

6 After taking the measurements, record them in a chart or in a notebook.

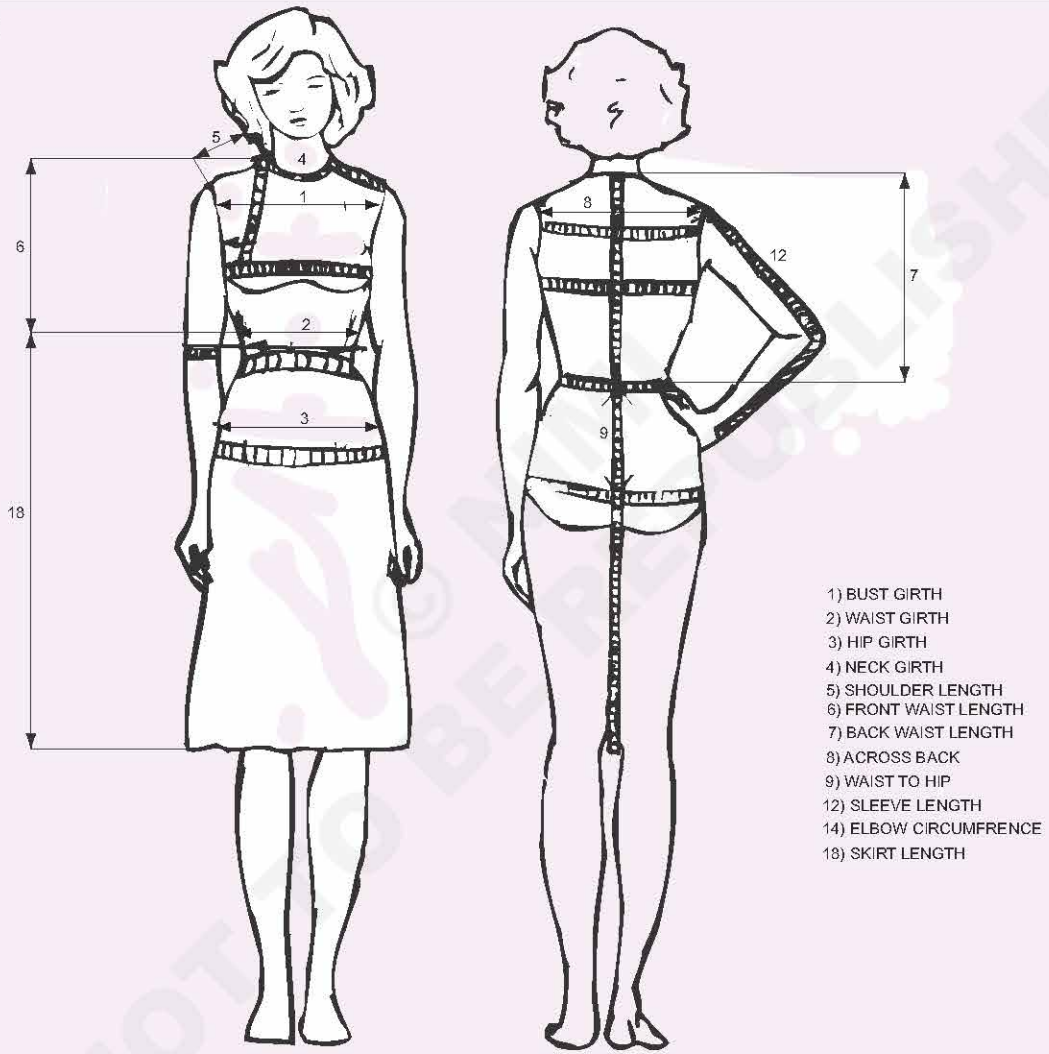
**Method of taking important body measurements for ladies', Gent's & Children's garments**

The various important body measurements used to construct ladies', Gent's and children's garments and method of taking each measurement are explained below with the help of the figures.

**1 Ladies measurements (Fig 10 &11)**

1 **Bust:** It should be measured around the fullest part of the bust, and the widest part of the back by keeping the tape straight across the back.

Fig 10




2 **Waist:** A ribbon or string should be tied snugly around the waist, and move to let it settle into the natural waistline. Measure around this marker. Do not pull the tape tight during measuring.

3 **Hip:** Keeping tape measure parallel to the floor, measure around the fullest part of the hip.

4 **Neck:** Measure around the midway level of the neck.

5 **Shoulder length:** Measure from the base of the neck to the shoulder edge.

6 **Front waist length:** Measure down from neck at highest point of shoulder to waistline.

7 **Back waist length:** It should be measured from prominent bone at base of neck, centre back, to the waistline.

8 **Across back:** It should be measured across the back from Armhole to Armhole.

9 **Waist to hip:** It is the measurement taken from waist line to hip line.

10 **Crotch length:** Measure from the back waistline down and through the leg and up to the front waistline. Divide the measurement into front and back crotch lengths at a mid-point between the legs.

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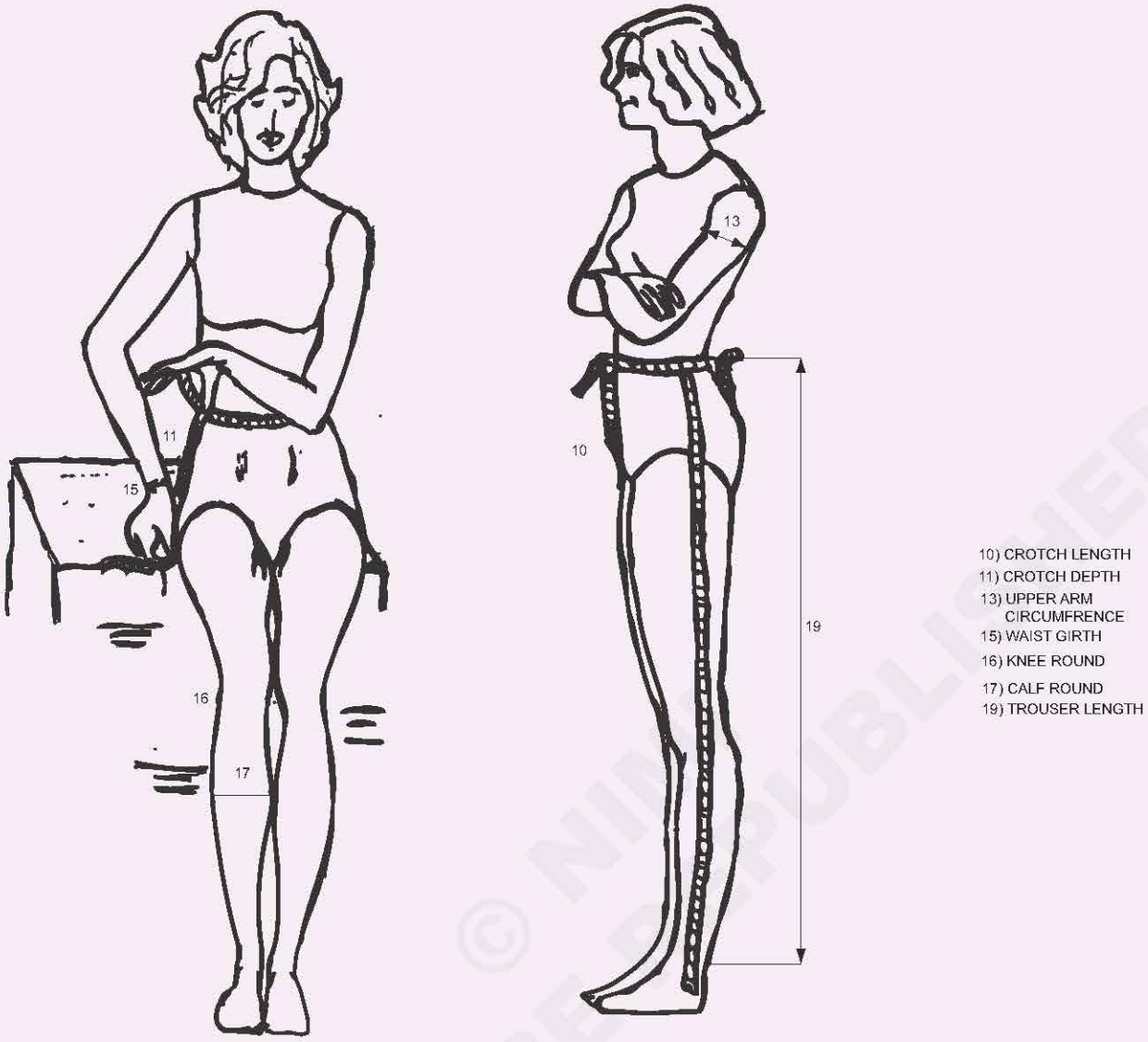
Fig 11




11 **Crotch depth:** This measurement should be taken in sitting position. Sit on a firm chair, feet flat on the floor. Measure from waist to chair seat.

12 **Sleeve length:** Place hand on hip, and measure from shoulder to elbow, then down to the wrist.

13 **Upper arm circumference:** It should be taken at the fullest part of the arm.

14 **Elbow circumference:** This is measured around the arm at elbow.

15 **Wrist girth:** It should be taken around the wrist portion.

16 **Knee round:** Measure taken around the knee.

17 **Calf round:** Measure taken around the calf.

18 **Skirt length:** Measure down the back from the waistline to the desired skirt length.

19 **Trouser length:** Measure from waist to ankle at the side of the leg.

**2 Children's measurements (Fig 12)**

For constructing children's garment, we have to take some additional measurements along with the above mentioned required measurements.

20 **Chest:** For children and men, bust measurement explained under ladies measurements is referred to as 'Chest measurement'.

21 **Frock length:** It should be measured down from the highest point of shoulder to desired length along the front.

22 **Thigh girth:** It should be measured around the widest part of the thigh. This measurement is very useful to construct the garments like shorts.

**3 Gent's measurements (Fig 13)**

For constructing gent's garments, we have to consider the following required measurements along with the previous mentioned measures.

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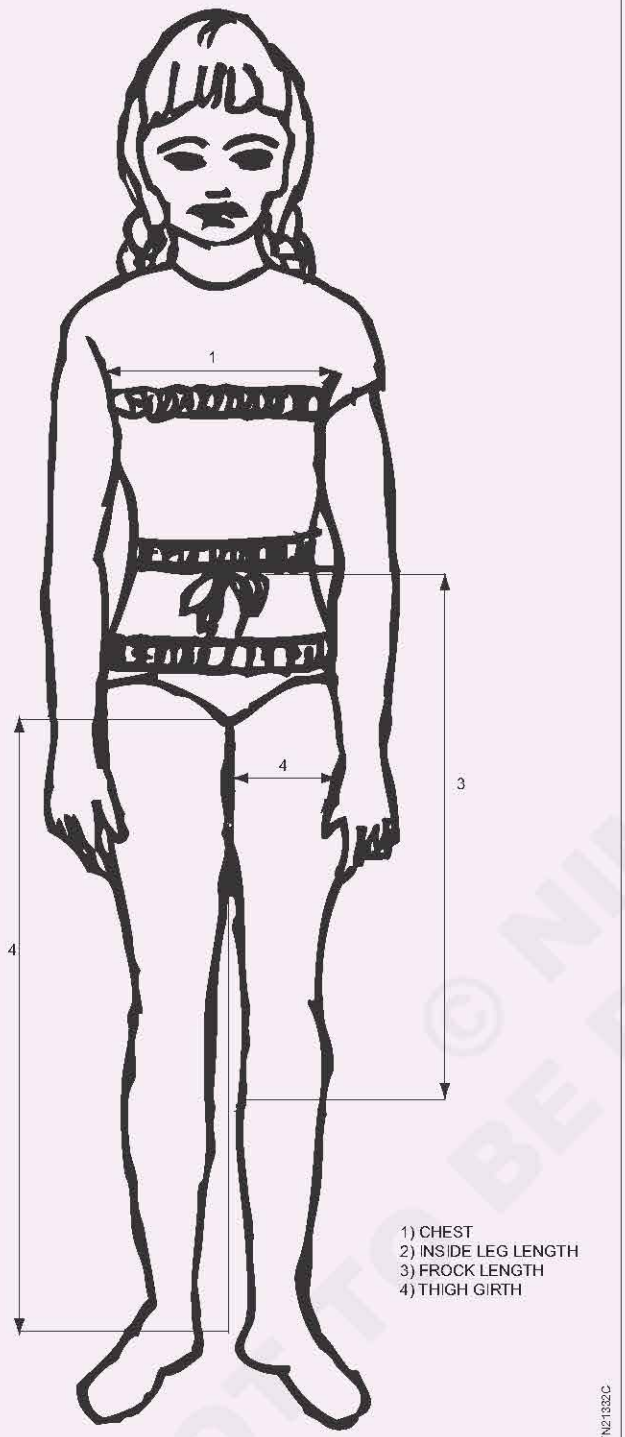
Fig12

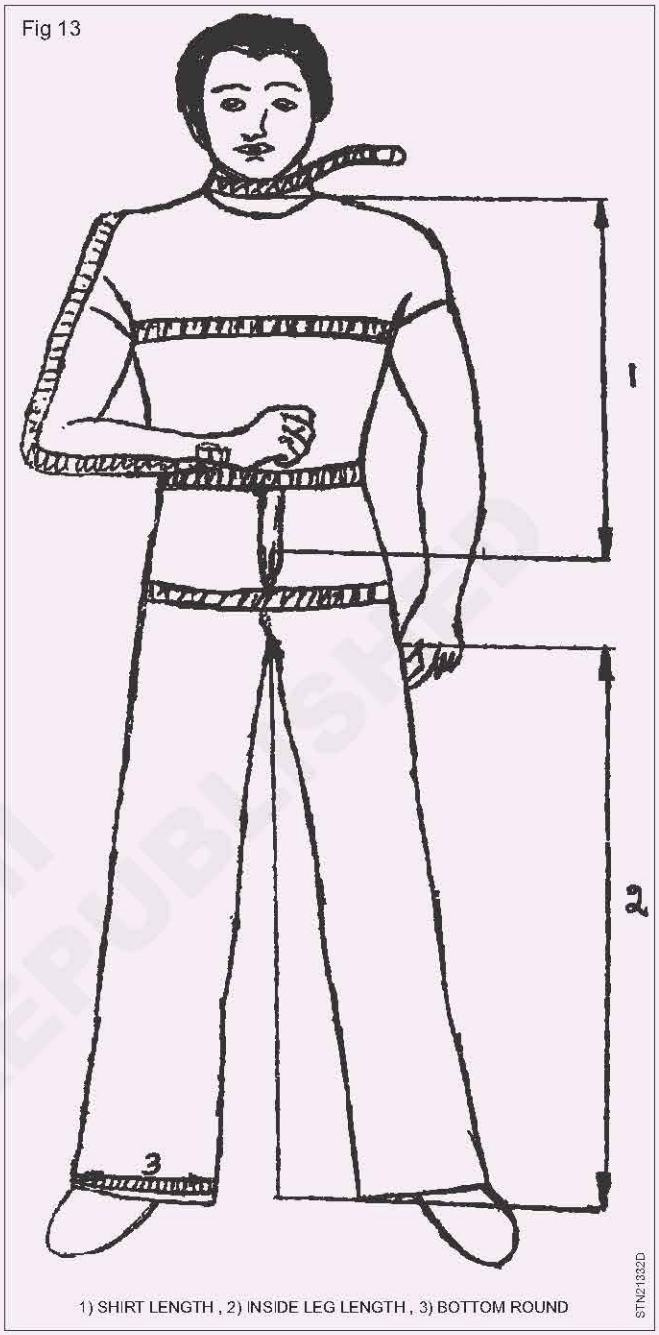



23 **Shirt length:** This measurement is useful for making shirts. Measure from neck at the highest point of shoulder to desired length along the front.

24 **Inside leg seam:** This is useful for making trousers. Measure inside leg from crotch point to hem length preferred.

25 **Bottom round:** It should be taken around the ankle and is used for constructing trousers. Measure round the bottom of the ankle with moderate loose. This measure varies according to the fashion and customer's taste.

Fig 13




**Type of Measurements:**

According to the method of taking, Measurements can be classified in to two types.

They are,

1 Length Measurements

2 Girth Measurements.

**Length Measurements**

While taking length measurements the measurement tape should be used in Lengthwise or width wise or in an angle but the tape ends not meet each other. The length measurements are further classified into following three types.

1 Vertical Measurements - Examples : Waist length, Side length, Sleeve length, etc.

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2 Horizontal Measurements - Examples : Shoulder end to end, Across Chest, etc.

3 Arc Measurements - Examples : Front Arm hole, Front fork length or Crutch length etc.

**Girth Measurements**

While taking Girth measurements, the measurement tape should be used in a circular manner around the body part and tape ends meets each other. Examples. Chest, Waist, Hip, etc.

**Measuring techniques**

**How to take body measurement?:** When taking measurement it is most accurate with under-garments or garments worn should be plain and well fitting.

Pull the tape firmly around the body part but not too tight; keep it parallel to the floor. Measure always around the fullest part of each body area.

**Measurement charts:** Every person has an individual height and shape of the body. Big, small, fat persons don't match with the ideal proportions. While stitching a garment the shape of the garment has to be adjusted to the shape of the body as much as possible.

The most accurate way of shaping a garment according to the individual body takes place on the basis of measuring an individual body. This measurement will reflect all individual conditions. Since the garment industry does not produce for an individual customer they produce dresses for body measurements which represent a larger number of persons. These measurements are found by measuring thousands and thousands of people of a certain region/ country. The data found in such a survey will be systematically organised in a chart valid for that particular area.

Even though many charts can be seen in books, a proper measurement chart for the Indian population is still missing. Therefore the Trade Practical book is not referring to a chart. The measurements given with every garment are based on experience, but it is always the best to take authentic measurement from the person to stitch the dress for.

| Sl. No. | Body measurement | Abbreviation | How to take body measurement |
|---|---|---|---|
| 1 | Natural Waist | NW | Measure on back from nape to waist |
| 2 | Full Length | FL | Measure from neck point to waistline upto the desired length of garment |
| 3 | Shoulder | Sh | Measure from left shoulder end to the right shoulder end (where you find the ball moving while moving your arm) |
| 4 | Sleeve length | SL | Measure from shoulder end to desired sleeve length (for full length arm should be in a bended position) |
| 5 | Sleeve bottom or round arm | SB | This is a garment measurement. It gives the desired girth of sleeve at bottom line |
| 6 | Chest | Ch | Measure around the fullest part of chest/bust above the nipple line (one finger loose) |
| 7 | Bust (Ladie's garment) | B | |
| 8 | Waist | W | Measure around the natural waist line, draw the tape close but not too tight |
| 9 | Hip | H | Measure firmly around the fullest part of hip |
| 10 | Neck | N | Measure loosely around the base of neck |
| 11 | Across chest | ACh | Measure across the chest line on skye level |
| 12 | Across back | AB | Measure on back from one sleeve joint to the other on skye level (Above the blade bone) |
| 13 | Bust level | BL | Measure from neck point (which is on the level of neckline at side) to bust |
| 14 | Leg Length (Side length) | LL | Measure outer leg length from waist to ankle (or desired length of garment) |
| 15 | Inner leg length | ILL | Measure from fork to ankle or leg length - body rise |
| 16 | Knee length | KnL | Measure from waist to knee on side of body |
| 17 | Body rise | BR | Measure from waist to seat line on side of body |

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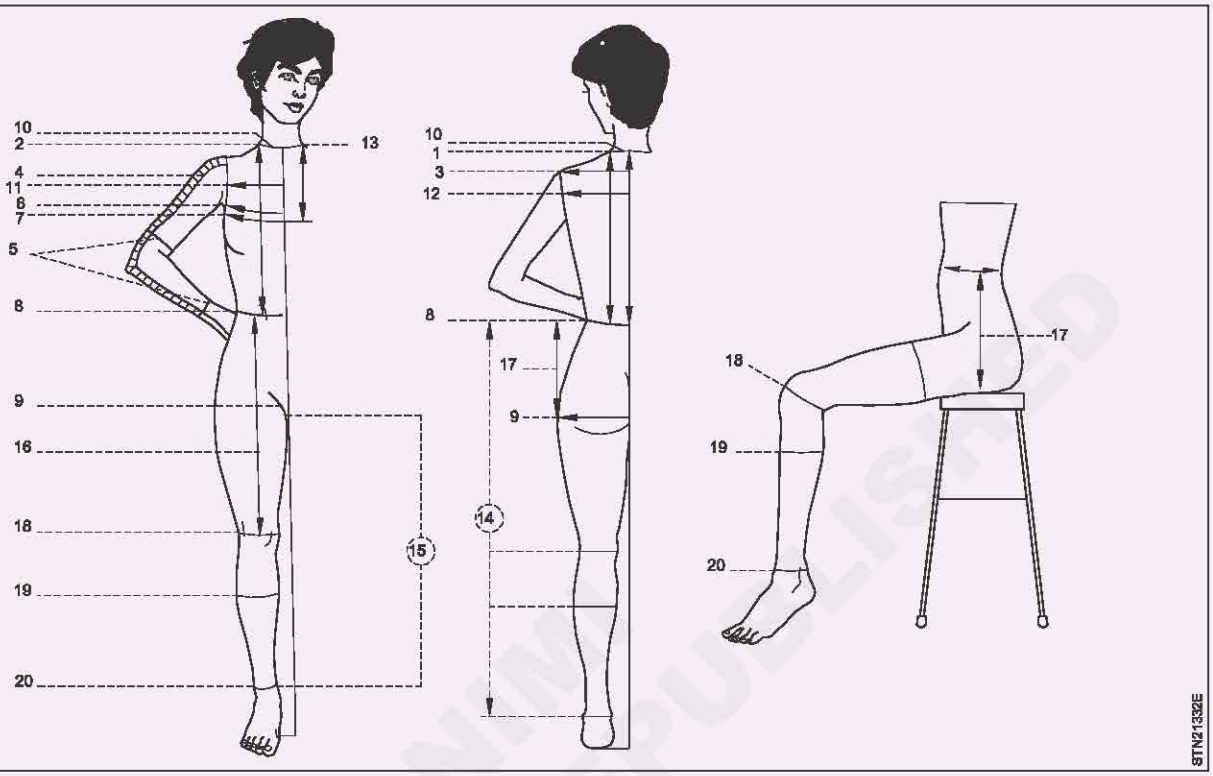
| | | | |
|---|---|---|---|
| 18 | Round knee | RKn | Measure firmly girth around the knee |
| 19 | Round calf | RC | Measure firmly girth around the calf |
| 20 | Round bottom | RB | This is a garment measurement! It gives the desired bottom girth of pant (Fig 14) |

Fig 14




## Size charts

**Objective:** At the end of this lesson you shall be able to
- **explain about size charts.**

A size chart is the dividing of average body or garment measurements artificially into categories to form a range of sizes. These average measurements are obtained from surveys of body measurements. Each size has to be given a code that is generally recognized by the public, such as 10, 12, 14, or labeled small, medium, large.

**Importance of size charts**

Size charts are important

1 To identify the size proportions and difference from each other in a particular age group.

2 For constructing (Sewing) Readymade garments.

3 To make the garment with fitting suitable for a particular group of measurements.

4 For pattern grading which is a time saving process.

**Size chart formulation**

There are five stages in developing size charts for garments:

Obtaining body measurements

Statistically analyzing the measurements

Adding ease allowances

Formulating the size charts

Fitting trials to test the size charts

Firstly the body measurements have to be obtained generally through surveys taken manually or with the use of computerized equipment. This is followed by the second stage of statistical analysis. Often the statistical analysis of the body measurements runs to several decimal points of a centimeter, which are inconsistent and inconvenient to use for clothing manufacture. This may require the raw data to be rounded up or down to a whole centimeter or to one decimal point. Therefore the second stage is to round the measurement data to produce tables of body measurement.

In the third stage a tolerance is added to the body measurements that are generally known as ease allow-

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ance. This is because garments have to be larger than the wearer to allow for movement and expansion. Three other factors which influence the ease allowance are;

The function of the garment and whether it is worn over other garments, e.g. a coat requires extra width.

The style of the garment and whether it is close or loose fitting which depends upon the current fashion.

The type of fabric, whether it is stable or extensible, e.g. woven or knitted.

Initially the appropriate amount of ease allowance to be added in the correct position has to be estimated. The correct amount can only be confirmed after fitting trials of sample garments.

The fourth stage is the formulation of size charts. These can be for either body measurements or garment measurements. It is difficult to manufacture a garment to an exact measurement due to dimensionally unstable fabric and sewing production. This requires a production tolerance to be calculated which is a measurement added to, or subtracted from, a garment measurement but still giving an acceptable size. When formulating size charts care has to be taken that the increment between the sizes is not the same as or less than the production tolerance.

The final, fifth, stage is testing the new size chart by constructing and grading patterns to the measurements, from which sample garments are cut and made. The sample garments are tested by fitting trials on groups of women of similar size. These trials confirm the correct sizes and also the amount and position of the ease allowances. If adjustments have to be made the charts and patterns are revised and re-tested.

The example of the three stages of formulating a size chart for a woman's skirt (measurements in centimeters) has been given in the following table.

| SIZE | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|
| To fit Waist | 62.0 | 66.0 | 70.0 | 74.0 | 79.0 |
| Hip | 88.0 | 92.0 | 96.0 | 100.0 | 105.0 |
| Waist Raw Data | 62.3 | 66.4 | 69.7 | 73.5 | 78.6 |
| Rounded | 62.0 | 66.0 | 70.0 | 74.0 | 79.0 |
| Plus ease | 66.0 | 70.0 | 74.0 | 78.0 | 84.0 |
| Hip Raw Data | 88.0 | 92.5 | 96.0 | 99.8 | 104.6 |
| Rounded | 88.0 | 92.0 | 96.0 | 100.0 | 105.0 |
| Plus ease | 92.0 | 96.0 | 100.0 | 104.0 | 110.0 |

**Standard body measurements - 4 cm and 6 Cm Increments (European Sizing)**

This chart is based on European body measurement size charts which follow the system of bigger intervals between the larger sizes.

**Note: The greatest percentage of the population falls into medium height range. Although the girth of women varies, the general trend is for weight to increase with height within this group.**

**Women of medium height 160 Cm - 172 Cm (5 ft 3 in - 5 ft 7 ½ in)**

| Size Code | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 |
|---|---|---|---|---|---|---|---|---|---|---|
| Bust | 80 | 84 | 88 | 92 | 96 | 100 | 104 | 110 | 116 | 122 |
| Waist | 62 | 66 | 70 | 74 | 78 | 82 | 86 | 92 | 98 | 104 |
| Hips | 86 | 90 | 94 | 98 | 102 | 106 | 110 | 116 | 122 | 128 |
| Back width | 32.4 | 33.4 | 34.4 | 35.4 | 36.4 | 37.4 | 38.4 | 39.8 | 41.2 | 42.6 |
| Chest | 30 | 31.2 | 32.4 | 33.6 | 34.8 | 36 | 37.2 | 39 | 40.8 | 42.6 |
| Shoulder | 11.75 | 12 | 12.25 | 12.5 | 12.75 | 13 | 13.25 | 13.6 | 13.9 | 14.2 |
| Neck size | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42.4 | 43.8 | 45.2 |
| Dart | 5.8 | 6.4 | 7 | 7.6 | 8.2 | 8.8 | 9.4 | 10 | 10.6 | 11.2 |
| Top arm | 25.6 | 27 | 28.4 | 29.8 | 31.2 | 32.4 | 33.8 | 35.8 | 37.8 | 39.8 |

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| Size Code | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 |
|---|---|---|---|---|---|---|---|---|---|---|
| Wrist | 15 | 15.5 | 16 | 16.5 | 17 | 17.5 | 18 | 18.5 | 19 | 19.5 |
| Ankle | 23 | 23.5 | 24 | 24.5 | 25 | 25.5 | 26 | 26.7 | 27.4 | 28.1 |
| High ankle | 20 | 20.5 | 21 | 21.5 | 22 | 22.5 | 23 | 23.7 | 24.4 | 25.1 |
| Nape to Waist | 40 | 40.5 | 41 | 41.5 | 42 | 42.5 | 43 | 43 | 43 | 43 |
| Front shoulder to waist | 40 | 40.5 | 41 | 41.5 | 42.3 | 43.1 | 43.9 | 44.7 | 45.5 | 46.3 |
| Armscye depth | 20 | 20.5 | 21 | 21.5 | 22 | 22.5 | 23 | 23.7 | 24.4 | 25.1 |
| Waist to knee | 57.5 | 58 | 58.5 | 59 | 59.5 | 60 | 60.5 | 61 | 61.5 | 62 |
| Waist to hip | 20 | 20.3 | 20.6 | 20.9 | 21.2 | 21.5 | 21.8 | 22.1 | 22.4 | 22.7 |
| Waist to floor | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
| Bodyrise | 26.6 | 27.3 | 28 | 28.7 | 29.4 | 30.1 | 30.8 | 31.8 | 32.8 | 33.8 |
| Sleeve length | 57.5 | 58 | 58.5 | 59 | 59.5 | 60 | 60.5 | 60.8 | 61.1 | 61.4 |
| Sleeve length (Jersey) | 51.5 | 52 | 52.5 | 53 | 53.5 | 54 | 54.5 | 54.8 | 55.1 | 55.4 |

**Extra Measurements**
(Garments)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cuff size shirts | 21 | 21 | 21.5 | 21.5 | 22 | 22.5 | 23 | 23.5 | 24 | 24.5 |
| Cuff size, two-piece sleeve | 13.25 | 13.5 | 13.75 | 14 | 14.25 | 14.5 | 14.75 | 15 | 15.25 | 15.5 |
| Trouser bottom width | 21 | 21.5 | 22 | 22.5 | 23 | 23.5 | 24 | 24.8 | 25.6 | 26.4 |
| Jeans bottom width | 18.5 | 18.5 | 19 | 19 | 19.5 | 20 | 20.5 | 20.5 | 20.5 | 20.5 |

Size charts for short and tall women have each vertical measurement adjusted as follows:

| | Short women 152 cm - 160 cm(5ft - 5 ft 3 in) | Tall women 172 cm - 180 cm (5 ft 7 ½ in - 5 ft 10 ½ in) |
|---|---|---|
| Nape to waist | - 2 cm | + 2 cm |
| Scye depth | -0.8 cm | +0.8 cm |
| Sleeve length | -2.5 cm | +2.5 cm |
| Waist to knee | -3 cm | + 3cm |
| Waist to floor | -5 cm | +5 cm |
| Body rise | -1 cm | +1 cm |

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**Standard Body Measurement Chart For High Street Fashion Garments**

| SML MED LGE XLGE | | | | |
|---|---|---|---|---|
| **Size symbol** | **S** | **M** | **L** | **XL** |
| Bust | 82 | 88 | 94 | 100 |
| Waist | 64 | 70 | 76 | 82 |
| Hips | 88 | 94 | 100 | 106 |
| Back width | 32.8 | 34.4 | 36 | 37.6 |
| Chest | 30.6 | 32.4 | 34.2 | 36 |
| Shoulder | 11.8 | 12.2 | 12.6 | 13 |
| Neck size | 35.5 | 37 | 38.5 | 40 |
| Dart | 6.1 | 7 | 7.9 | 8.8 |
| Top arm | 26.4 | 28.4 | 30.4 | 32.4 |
| Wrist | 15.3 | 16 | 16.7 | 17.4 |
| Ankle | 23.1 | 24 | 24.9 | 25.8 |
| High ankle | 20.1 | 21 | 21.9 | 22.8 |
| Nape to waist | 40.4 | 41 | 41.6 | 42.2 |
| Front shoulder to waist | 40.4 | 41 | 41.6 | 42.2 |
| Armscye depth | 20.4 | 21 | 21.6 | 22.2 |
| Waist to knee | 57.7 | 58.5 | 59.3 | 60.1 |
| Waist to hip | 20.2 | 20.6 | 21 | 21.4 |
| Waist to floor | 102.5 | 104 | 105.5 | 107 |
| Bodyrise | 27 | 28 | 29 | 30 |
| Sleeve length | 57 | 58 | 59 | 60 |
| Sleeve length (Jersey) | 51 | 52 | 53 | 54 |

Small = approx.size 8 -1 0

Medium = size 12

Large = approx.size 14 - 16

X Large = approx.size 18

STANDARD BODY MEASUREMENTS: GIRLS 3 - 14 YEARS

Sizes 98 - 164 cm height

| **Height** | **98** | **104** | **110** | **116** | **122** | **128** | **134** | **140** | **146** | **152** | **158** | **164** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Approximate age** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | | | **14** |
| Chest | 55 | 57 | 59 | 61 | 63 | 66 | 69 | 72 | 75 | 78 | 81 | 84 |
| Waist | 52 | 54 | 56 | 58 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 |
| Hip/Seat | 56 | 59 | 62 | 65 | 68 | 71 | 74 | 77 | 80 | 83 | 86 | 89 |
| Across back | 22.8 | 23.6 | 24.4 | 25.2 | 26 | 27.1 | 28.2 | 29.3 | 30.4 | 31.5 | 32.6 | 33.7 |
| Neck size | 26.6 | 27.2 | 27.8 | 28.4 | 29 | 30 | 31 | 32 | 33 | 34 | 353 | 36 |

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| Height | 98 | 104 | 110 | 116 | 122 | 128 | 134 | 140 | 146 | 152 | 158 | 164 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shoulder | 7.4 | 7.8 | 8.2 | 8.6 | 9 | 9.5 | 10 | 10.5 | 11 | 11.5 | 12 | 12.5 |
| Upper arm | 18.5 | 19 | 19.5 | 20 | 20.5 | 21.3 | 22.1 | 22.9 | 23.7 | 24.5 | 25.3 | 26.1 |
| Wrist | 12.8 | 13 | 13.2 | 13.4 | 13.6 | 13.9 | 14.2 | 14.5 | 14.8 | 15.1 | 15.4 | 15.7 |
| Scye depth | 13.2 | 13.8 | 14.4 | 15 | 15.6 | 16.3 | 17 | 17.7 | 18.4 | 19.1 | 19.8 | 20.5 |
| Back neck waist | 24.2 | 25.4 | 26.6 | 27.8 | 29 | 30.4 | 31.8 | 33.2 | 34.6 | 36 | 37.4 | 38.8 |
| Waist hip | 12.3 | 12.9 | 13.5 | 14.1 | 14.7 | 15.4 | 16.1 | 16.8 | 17.5 | 18.2 | 18.9 | 19.6 |
| Cervical height | 80 | 85.4 | 90.8 | 96.2 | 101.6 | 107 | 112.4 | 117.8 | 123.2 | 128.6 | 134 | 139.4 |
| Waist-knee | 34 | 36 | 38 | 40 | 42 | 44.2 | 46.4 | 48.6 | 50.8 | 53 | 55.2 | 57.4 |
| Bodyrise | 16.8 | 17.6 | 18.4 | 19.2 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| Inside leg | 41 | 44.5 | 48 | 51.5 | 55 | 58 | 61 | 64 | 67 | 70 | 73 | 76 |
| Arm length | 34 | 36.5 | 39 | 41.5 | 44 | 46 | 48 | 50 | 52 | 54 | 56 | 58 |
| Head circumference | 51.2 | 51.8 | 52.4 | 53 | 53.6 | 54 | 54.4 | 54.8 | 55.2 | 55.6 | 56 | 56.4 |
| Ankle girth | 15.5 | 16 | 16.5 | 17 | 17.5 | 18 | 18.5 | 19 | 19.5 | 20 | 20.5 | 21 |

**Extra Measurements(Garments)**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cuff size, two-piece sleeve | 10.2 | 10.4 | 10.6 | 10.8 | 11 | 11.4 | 11.8 | 12.2 | 12.6 | 13 | 13.4 | 13.8 |
| Cuff size, Shirts | 15.4 | 15.8 | 16.2 | 16.6 | 17 | 17.5 | 18 | 18.5 | 19.5 | 20 | 20.5 | 21 |
| Trouser bottom width | 16 | 16.5 | 17 | 17.5 | 18 | 18.5 | 19 | 19.5 | 20 | 20.5 | 21 | 21.5 |

**Standard Body Measurements: Boys 3 - 14 Years**

Sizes 98 - 170 cm height

| Height | 98 | 104 | 110 | 116 | 122 | 128 | 134 | 140 | 146 | 152 | 158 | 164 | 170 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approximate age | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | ---------- | ----14 |
| Chest | 55 | 57 | 59 | 61 | 64 | 67 | 70 | 73 | 76 | 79 | 82 | 86 | 90 |
| Waist | 52 | 54 | 56 | 58 | 60 | 62 | 64 | 66 | 68 | 70 | 72 | 74 | 76 |
| Hip/Seat | 55 | 58 | 61 | 64 | 67 | 70 | 73 | 76 | 79 | 82 | 85 | 89 | 93 |
| Across back | 23.2 | 24 | 24.8 | 25.6 | 26.8 | 28 | 29.2 | 30.4 | 31.6 | 32.8 | 34 | 35.6 | 37.2 |
| Neck size | 26.7 | 27.3 | 27.9 | 28.5 | 29.5 | 30.5 | 31.5 | 32.5 | 33.5 | 34.5 | 35.5 | 36.5 | 37.5 |
| Shoulder | 7.8 | 8.2 | 8.6 | 9 | 9.5 | 10 | 10.5 | 11 | 11.5 | 12 | 12.5 | 13.1 | 13.7 |
| Upper arm | 18.5 | 19 | 19.5 | 20 | 20.8 | 21.6 | 22.4 | 23.2 | 24 | 24.8 | 25.6 | 26.6 | 27.6 |
| Wrist | 13 | 13.2 | 13.4 | 13.6 | 14 | 14.4 | 14.8 | 15.2 | 15.6 | 16 | 16.5 | 17 | 17.5 |
| Scye depth | 13.2 | 13.8 | 14.4 | 15 | 15.8 | 16.6 | 17.4 | 18.2 | 19 | 19.8 | 20.6 | 21.6 | 22.6 |

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| Height | 98 | 104 | 110 | 116 | 122 | 128 | 134 | 140 | 146 | 152 | 158 | 164 | 170 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Back neck waist | 24.2 | 25.4 | 26.6 | 27.8 | 29.2 | 30.6 | 32 | 33.4 | 34.8 | 36.2 | 37.6 | 39.4 | 41.2 |
| Waist hip | 12 | 12.6 | 13.2 | 13.8 | 14.4 | 15 | 15.6 | 16.2 | 16.8 | 17.4 | 18 | 18.8 | 19.6 |
| Cervical height | 80.4 | 85.8 | 91.2 | 96.6 | 102 | 107.4 | 112.8 | 118.2 | 123.6 | 129 | 134.4 | 139.8 | 145.2 |
| Bodyrise | 17.2 | 18 | 18.8 | 19.6 | 20.4 | 21.2 | 22 | 22.8 | 23.6 | 24.4 | 25.2 | 26.2 | 27.2 |
| Inside leg | 41 | 44.5 | 48 | 51.5 | 55 | 58 | 61 | 64 | 67 | 70 | 73 | 75.5 | 78 |
| Arm length | 34.5 | 37 | 39.5 | 42 | 44.5 | 47 | 49.5 | 52 | 54.5 | 57 | 59 | 61 | 63 |
| Head circumference | 52 | 52.5 | 53 | 53.5 | 54 | 54.5 | 55 | 55.5 | 56 | 56.5 | 57 | 57.4 | 57.8 |

**Extra Measurements (Garments)**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cuff size, Two-piece sleeve | 10.4 | 10.6 | 10.8 | 11 | 11.2 | 11.6 | 12 | 12.4 | 12.8 | 13.2 | 13.6 | 14 | 14.4 |
| Cuff size, shirts | 15.4 | 15.8 | 16.2 | 16.6 | 17 | 17.5 | 18 | 18.5 | 19 | 19.5 | 20 | 20.5 | 21 |
| Trouser bottom width | 16 | 16.5 | 17 | 17.5 | 18 | 18.5 | 19 | 19.5 | 20 | 20.5 | 21 | 21.5 | 22 |
| Jeans bottom width | 13.5 | 14 | 14.5 | 15 | 15.5 | 16 | 16.5 | 17 | 17.5 | 18 | 18.5 | 19 | 19.5 |

**Size conversions**

Clothing sizes in the United States are different than those found in most other countries. If you are a visitor from another country shopping for clothes in the USA, it might be useful to know the differences in US sizes. The following table is designed to be a useful tool in converting UK sizes to approximate US sizes. The data have been found as accurate as possible but it cannot be taken guarantee that it is absolutely correct. Sizes of clothing vary between manufacturers and even between different designs by the same manufacturer. You should use these charts for approximation only.

| Sizes | | Body Measurements | | |
|---|---|---|---|---|
| US Size | UK Size | Bust Inches | Waist Inches | Hip Inches |
| 2 | 6 | Up to 32 | Up to 25 | Up to 33 ½ |
| 4 | 8 | 32 - 33 ½ | 25 - 26 ½ | 33 ½ - 35 |
| 6 | 10 | 34 - 35 ½ | 27 - 28 | 35 ½ - 37 |
| 8 | 12 | 36 - 37 | 28 ½ - 30 | 37 ½ - 39 |
| 10 | 14 | 37 ½ - 39 | 30 ½ - 32 | 39 ½ - 41 |
| 12 | 16 | 39 ½ - 41 | 32 ½ - 34 | 41 ½ - 43 |
| 14 | 18 | 41 ½ - 43 | 34 ½ - 36 ½ | 43 ½ - 45 ½ |
| 16 | 20 | 43 ½ - 45 ½ | 37 - 39 | 46 - 48 |
| 18 | 22 | 46 - 48 | 39 ½ - 41 ½ | 48 ½ - 50 ½ |

With the help of the following dress size table for women, we can understand the size category equivalency of various countries.

**Dress Sizes Table for Women**

| US | US (L) | UK | Europe | Italy | Australia | Japan |
|---|---|---|---|---|---|---|
| 2 | X-Small | 4 | 32 | 36 | 6 | 5 |
| 4 | Small | 6 | 34 | 38 | 8 | 7 |
| 6 | Small | 8 | 36 | 40 | 10 | 9 |
| 8 | Medium | 10 | 38 | 42 | 12 | 11 |
| 10 | Medium | 12 | 40 | 44 | 14 | 13 |
| 12 | Large | 14 | 42 | 46 | 16 | 15 |
| 14 | Large | 16 | 44 | 48 | 18 | 17 |
| 16 | X-Large/1X | 18 | 46 | 50 | 20 | 19 |
| 18 | 1X/2X | 20 | 48 | 52 | 22 | 21 |
| 20 | 2X | 22 | 50 | 54 | 22 | 23 |
| 22 | 3X | 24 | 52 | 56 | 24 | 25 |
| 24 | 3X | 26 | 54 | 58 | 26 | 27 |

Body Measurement Chart For Gent's Garments (U.K. Standard)

| Sl.No. | Measurements | Chest Sizes Between (In Cms.) | | | |
|---|---|---|---|---|---|
| | | S - Small (88 - 92) | M - Medium (96-100) | L - Large (104-108) | XL - Extra Large (112 to 116) |
| 1 | Chest | 92 | 100 | 108 | 116 |
| 2 | HIP | 94 | 102 | 100 | 118 |
| 3 | Natural waist | 75 | 83 | 91 | 99 |
| 4 | Trousers waist (4 cms. below natural waist) | 78 | 86 | 94 | 100 |
| 5 | Half back | 19 | 20 | 21 | 22 |
| 6 | Natural waist length | 44 | 44.8 | 45.6 | 46.4 |
| 7 | Skye depth | 23 | 24.6 | 26.2 | 27.8 |
| 8 | Nack size | 39 | 41 | 43 | 45 |
| 9 | Sleeve length | 64 | 65 | 66 | 67 |
| 10 | Inside leg | 79 | 81 | 83 | 85 |
| 11 | Body rise | 27.5 | 28.5 | 29.5 | 30.5 |
| 12 | Shirt length | 84 | 85 | 86 | 87 |
| 13 | Trousers bottom | 24 | 25 | 26 | 27 |
| 14 | Jeans bottom | 21 | 22 | 23 | 24 |
| 15 | Cuff measurement | 22 | 23 | 24 | 25 |

The following table shows the size equivalence of US, UK and Europe systems for men's garments.

**Suits, Coats, Sweaters Sizes Table for Men**

| US - Canada | UK | Europe |
|---|---|---|
| 30 | 30 | 40 |
| 32 | 32 | 42 |
| 34 | 34 | 44 |
| 36 | 36 | 46 |
| 38 | 38 | 48 |
| 40 | 40 | 50 |
| 42 | 42 | 52 |
| 44 | 44 | 54 |
| 46 | 46 | 56 |
| 48 | 48 | 58 |
| 50 | 50 | 60 |
| 52 | 52 | 62 |

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**Common fitting errors and their solutions**

| Problems | Solutions |
|---|---|
| Folds below the bust dart. | Undo the dart and part of the side seam. Lift the shoulder, re-pin a larger dart and pin the side seam to take out the excess fabric. |
| Gaping armhole | Undo dart and pin a bigger dart. Making sure that it points towards the bust point. Lift shoulder seam at the armhole. |
| Low neckline gapes. | Lift the front shoulder seam. Lower the dart point if necessary. |
| Folds in the dress below the waist. | Undo the side seam from below the armhole and ease out until the garment hangs smoothly. |
| Tight neck or armhole. | Slash and snip seam grant to release tension |
| Neckline stands away and folds below. | Release shoulder seam and let it out at the armhole edge |
| Shoulder seam lies towards the front of the shoulder. | Undo shoulder seam and release front seam allowances only. |
| Sleeve hangs towards the back | Remove the sleeve and re-pin by moving the notch at the centre of the sleeve toward the back so that the sleeve may hang towards the front. |
| Wrinkles and creases around the upper arm. | Release the underarm seam allowance and add the ease. |
| Sleeve pulls at the back armhole. | Unpin the sleeve and release the seam allowance on both the armholes of sleeve and bodice. |
| Trousers are loose at waist, hip or leg. Creases on leg and trousers stands away at waist. | Leave the darts and decrease their width and length, also release some ease on the outer seams and re-pin. |
| Trousers tight below the waist, crease around abdomen. | Release darts and reduce their width and length, also release some ease on the outer seams and re-pin. |

**Small hips:** Draw a vertical slash line from the waist to the hem of the skirt pattern. Draw a horizontal line from centre back to the side seam passing through the fullest part of the hip. Slash the pattern on both the lines and overlap width wise to remove excess without loosing at the waist, unless the dart intake can be taken out for ease. Overlap length wise to remove excess without loosing at the side seam. True the seam lines.

**Large hips:** Draw a vertical slash line from the waist to the hem of the skirt pattern. Draw a horizontal line from centre back to the side seam passing through the fullest part of the hip. Slash the pattern on both the lines and spread width wise to fullness; the added ease may be taken in the dart intake. Spread length wise to add fullness without adding at the side seam. True the seam lines.

Given below are some of the common fitting problems that would necessitate pattern alterations with illustrated solutions by draping method.

**Wrinkling, pulling, straining, binding:** This may be due to insufficient width across the sleeve cap, across the chest or back. Unpin the sleeve. Use some of the sleeve seam allowances at the armhole and sleeve cap for more width.

**Tight armhole:** Drop the armhole by requisite amount. Add width at both the armhole and sleeve edge. Use some of the under arm seam allowances at sleeve and side seam.

**Short sleeve stands out at the hem:** This is due to insufficient length of the sleeve cap. Draw a slash line across the cap. Slash and spread to the needed amount. Correct the armhole curve.

**Sleeve cap wrinkles across the top of the sleeve:** This indicates too much length at sleeve cap. Draw a slash line across the cap. Slash and overlap to the needed amount. Correct the armhole curve.

**Heavy arm:** Draw an upturned slash line on each side of the sleeve opening at under arm to the lower edge of the sleeve. Slash and spread the pattern to half the needed amount to each side at the underarm and tapered to nothing at the lower edge. Make identical changes in the armhole seam of the front and back bodice. Draw a slash line from the underarm to waistlines in front and back bodice. Slash and spread the pattern to the same amount as that added on each side of the sleeve, starting at the underarm and tapering to nothing at the lower edge.

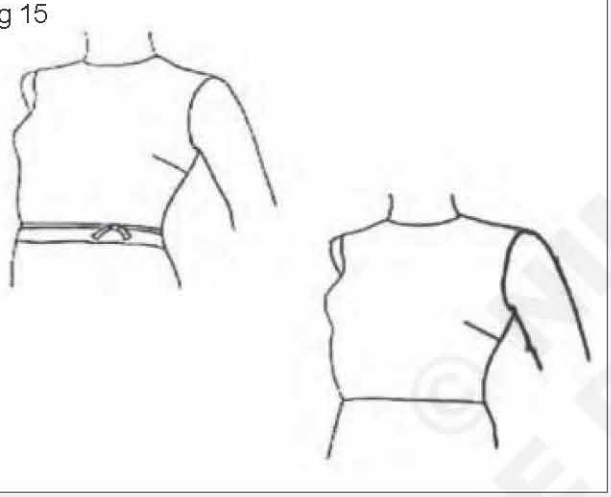
**Tight upper arm:** Slash the sleeve at the centre from shoulder point to the lower edge. Spread at the cap the essential amount tapering at the lower edge.

**Bust alterations**

Since the bust area is the most difficult to fit being the rounded part of the body. Check the garment; it should be neither too tight nor too loose. Big alterations are not very effective in this area especially for closer fitting garments.

**Bust with a large cup:** As you know, women with the same bust size have different cup sizes. These causes the garment to be tight over the bust area. Draw a upright slash line from the shoulder passing through the bust point to the other edge of the pattern, passing through the waistline dart. Draw a vertical line to this line at the bust point from centre front to the side seam. Slash on all lines and spread the pattern adding at the bust area without increasing at the shoulder.The added width at the side seam and waistline should be taken in a dart. If the dart intake is very big it is advisable to convert it into two darts.

Fig 15



**Bust with a small cup:** Draw a vertical slash line from the shoulder passing through the bust point to the other edge of the pattern, passing through the waistline dart. Draw a perpendicular to this line at the bust point from centre front to the side seam. Slash on all lines and overlap the pattern without reducing on the shoulder.

**Hip pattern alterations**

Fitting problems in this are manifest themselves in wrinkling, pulling, sagging and uneven hemlines.

**Methods of fit**

**There are two kinds of fitting:**

1 The first test fit is done on muslin at the time when the design is made. A basic test fit is done to cross check, the pattern fitting; the pattern is cut with relevant seam allowances and pinned in place for test fitting. Make sure that seams and darts are in place. This fitting is done from the right side of the garment. These corrections become the new seam lines for the garment. Check the garment for ease and fullness. It is important to mark buttons and buttonholes at right places in this fit.

2 The second is after the garment has been stitched before final finishing. Stitch the garment with relevant interfacing/ or underlining in place press it well and test fit to check the position of darts, seams, puckers if any and find the position of outer seams. This sort of fitting improves the fit of the attire. Other times when refitting happens, if the garment has been purchased readymade from the market some alterations may be required for it to be fitted to an individual's size and also if there are changes in the body size. The methods by which each pattern seam or area is to be corrected or reformed depends on the type of problems and nature of the fitting defect. The major problem areas have been previously recognized and thoroughly explained. There are areas that require minor modifications those have been explained and those that require some pattern manipulation have been shown with figures and explained briefly.

Given below are some of the fitting problems that would necessitate pattern alterations.

**Waist alterations**

**Thick waists** reduce the size of the darts and or add at the side seam.

**Slim waists** upsurge the size of the darts and take some at the side seam. If alteration is a small amount then the changes may be made in either in the darts or on the side seam. But in case the amount is adequately large than half of it should be altered in the dart and half in the side seam.

**Shoulder alterations**

Since the clothes hang from the shoulder their correct fit begins the lines and shaping of the rest of the garment.

**Narrow shoulders:** On front and back pattern; draw L-shaped slash lines from mid shoulder to notches on the armhole. Slash and overlap the pattern at shoulder to the needed amount. Redraw the shoulder line.

**Square armholes:** On front and back pattern, draw slash lines from neck to armhole edges. Slash and spread the pattern at armhole edges to the needed amount. Raise the armhole curve by the correction amount. Redraw the pattern on a new sheet or add paper to fill the gap

**Broad shoulders:** On front and back pattern draw L-shaped slash lines from mid shoulder to notches on the armhole. Slash and spread the pattern at shoulder to the needed amount. Redraw the pattern or insert paper in the gap. Correct the shoulder lines.

**Sloping shoulders:** On front and back pattern draw slash lines from neck to armhole edges. Slash and overlap the pattern at armhole edges to the needed amount. Pin the pattern piece or scotch- tape it to the required position. Redraw the armhole curves, lowering them at underarm by the same amount that you have taken in for corrections.

**Round armholes:** On front and back pattern, draw slash lines from neck to armhole edges. Slash and overlap the

pattern at armhole edges to the needed amount. Redraw the armhole curves, lowering them at underarm by the same amount that you have taken in for corrections.

**Sleeve alterations**

The sleeve hangs from the shoulder and setting of the sleeve starts at the shoulder. Check that the armhole is neither too tight nor too loose otherwise a sleeve will not set in properly.

## Inspections and Alterations for Fittings

**Objectives:** At the end of this lesson you shall be able to

- **know the importance of basic elements of garment fitting**
- **carry out fitting inspection explain about types and importance of patterns**
- **recognise the common fitting errors and their solutions.**

**Record and alterations as per requirement of customer**

A well-fitted garment is very important to reach the satisfaction level of a client who wears tailored attire. Every detail has to be attended to, when a tailor does fittings. If the fittings are improper the look and design of the garment completely destroyed.

**A good fit is based on 5 classic elements**

**Grain:** For a good fit the garment should be cut on the right grain. If the costume is off-grain, the seam lines may twist or hang crooked. Imprecise cutting or stitching may result in deviation in the grain line.

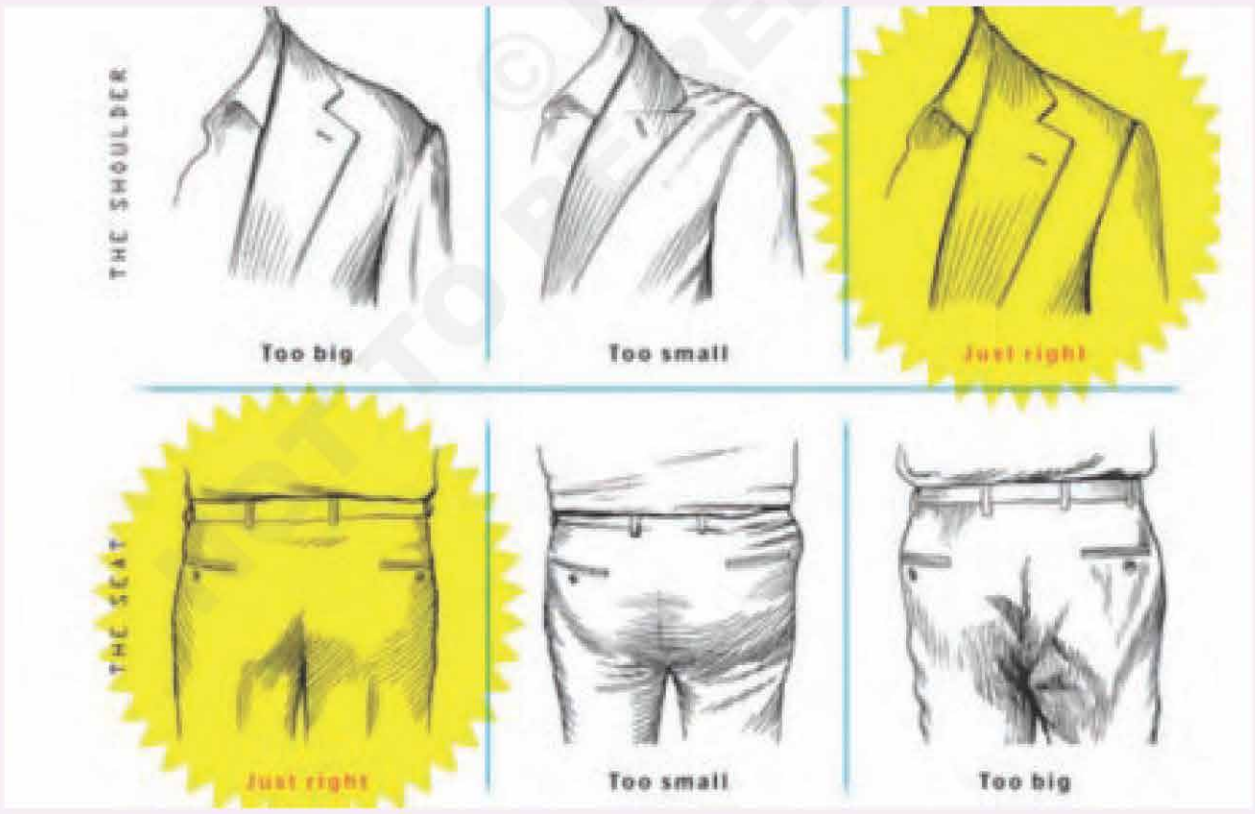
**Set:** Is when the garment fits perfectly without any undesirable wrinkles. Wrinkles usually occur because the garment is too large or too small for the customer.

**Line:** Refers how the lines of the garment are in alignment with the natural lines of the body. Poor design or construction can result in an out of line garment

**Balance:** occurs when the garment is in equilibrium. The garment should appear symmetrical, when viewed from any angle.

**Ease:** Is how fitted or airy the fittings of the garment is. A good fitted garment will give some room to breathe and won't be too fitted or tight.

Fig 16



# Types and patterns layout

**Objectives:** At the end of this lesson you shall be able to
- **explain about types and importance of patterns**
- **describe the pattern terminology.**

### Pattern

A pattern can be defined as a model or a replica of the various components of a garment. It can be made of paper or plastic. Normally papers are used to make the patterns which are cheaper than plastic or other materials. In industries, they are using thick paper or card board instead of tissue paper for frequent applications.

### Importance of paper patterns

1 Basically, patterns are acting as a time saving device. If we have cut a pattern then all garments of the same size can be cut with the same pattern. By this, we will save our precious time, by avoiding the drafting process on each and every fabric. And also, it is not easy to draft straight away on the fabric. With the help of the paper pattern, marking process can be done quickly.

2 We can preserve the paper patterns and use them whenever we want. For that, in industries, the patterns are made using thick paper or card board.

3 Paper patterns are very useful for "Pattern grading" process. Using pattern grading process, we can enlarge or reduce the base pattern from one size to another size.

4 Paper patterns are helpful in making pattern layout. The patterns can be arranged in the open width of the fabric, and with this pattern layout. The patterns can be arranged in the open width of the fabric, and with this pattern layout we can estimate the amount of fabric for making a garment. Using economical pattern layout, we can reduce the cloth consumption for a garment.

5 If the pattern is not suitable for one's fitting, we can alter the pattern for obtaining a good fit.

6 With the help of the base pattern, new designs can be tried on it which can make beautiful garments. The basic pattern may be modified for varied styles, and this technique is called as 'Flat pattern designing'.

### Pattern Information

### Commercial patterns

They are also referred to as 'Ready-made patterns'. Patterns prepared on the basis of standard measurements are called as commercial patterns or ready-made patterns. Commercial patterns are easily available in foreign countries. Many companies standardise their patterns after doing a lot of research and trying out the fit on models. The commercial patterns are available in various sizes. So, one can easily buy a pattern is required size suitable for him.

A commercial pattern has three main parts; the envelope, the instruction sheet, and the pattern tissue. The envelope which contains the other two components, is printed with a photograph or illustrations of the garments, plus the information that is required to select the appropriate size of pattern and purchase the correct amount of fabric and other details like fasteners & accessories. The front part of the envelope contains the different versions of the finished garment produced from the pattern. The back part of the envelope contains charts detailing the fabric amount required for each version. Size charts, recommended fabrics and drawings of the garment detail are also given.

### Advantages of commercial patterns

Commercial patterns save our time and effort. If our measurements suit with a particular size, it would be simpler to buy a commercial pattern than drafting one our self. If we not have knowledge in cutting, using the readymade patterns we can make a garment with good fitting.

**Disadvantages:** Ready-made patterns do not give good fit without some pattern alternations. If our measurements don't have the same proportions as the standard figure. Pattern alternations are more complicated processes than drafting patterns. Moreover, commercial patterns are expensive.

**Personal patterns:** Patterns drafted using personal or one's individual measurements are called as 'Personal patterns'. They are also referred to as individual patterns. If we know pattern cutting, we can make patterns ourselves, which will give good fitting rather than ready-made patterns. It is very economical and we can create own designs.

### Principles for pattern drafting

While drafting patterns, the following principles have to be followed.

1 Select a suitable paper for drafting patterns which should not be too thin.

2 Use suitable instruments like, long scale, 'L' type scales, set squares, french curves, etc., for accurate drafting.

3 Use a sharp pencil for fine and neat lines and accurate

drafting.

4 Before drafting the patterns, check the measurements clearly and read the procedures and instructions carefully. Note the important points in a paper.

5 Make a rough diagram before drafting. This will give an idea for drafting patterns with perfection.

6 Before drafting, we have to decide the amount of ease allowances to be given at the required portions. The prepared patterns must be larger than body measurements to allow for freedom of movement., ease of action and comfort in wearing. For that ease allowance are given along with the body measurements for free body movements.

7 Seam allowance should be decided first before drafting the patterns. According to the seam and stitch types, we have to give seam allowance at the outlines of the patterns.

8 If a pattern has symmetric design where the right and left sides are alike, we may make only the half part of the pattern. Ex. Shirt back, Shirt yoke, etc. For asymmetric designed patterns, full pattern must be drafted. Ex. Sleeve.

9 Check the draft before cutting the patterns.

After drafting the patterns, the following details and informations should be recorded and marked clearly on the patterns.

i Name of the style. (Ex. Gent's shirt, Skirt, etc.)

ii Name of each piece of pattern. (Ex. Front, Sleeve, etc.)

iii Size of the garment (Ex. M, L, Chest measurement, Hip measurements, etc.)

iv Number of pieces to be cut with each pattern piece. (For example for shirt, we have to cut 2 fronts, 1 back, 2 yokes, 2 sleeves, 2 collars and 2 collar bands)

v The cutting line should be clearly marked. After that the seam line should be marked using dotted line.

vi Grain line should be drawn on all the pattern pieces. This line indicates that the pattern should be kept on the cloth in such a way that the line is parallel to the length of the cloth or the selvedge's.

vii The places of darts and pleats should be clearly marked.

viii The positions of buttons and button holes should be marked.

ix Fold line should be clearly shown. Bottom hem line should be marked to show where the material is to be folded.

x Centre front and centre back line should be marked. Inward and outward notches should be marked to identify the position of pleat, dark, hemline, centre of the piece, etc., on the cut components while constructing the garments.

**Pattern Making Techniques:**

1 Drafting method

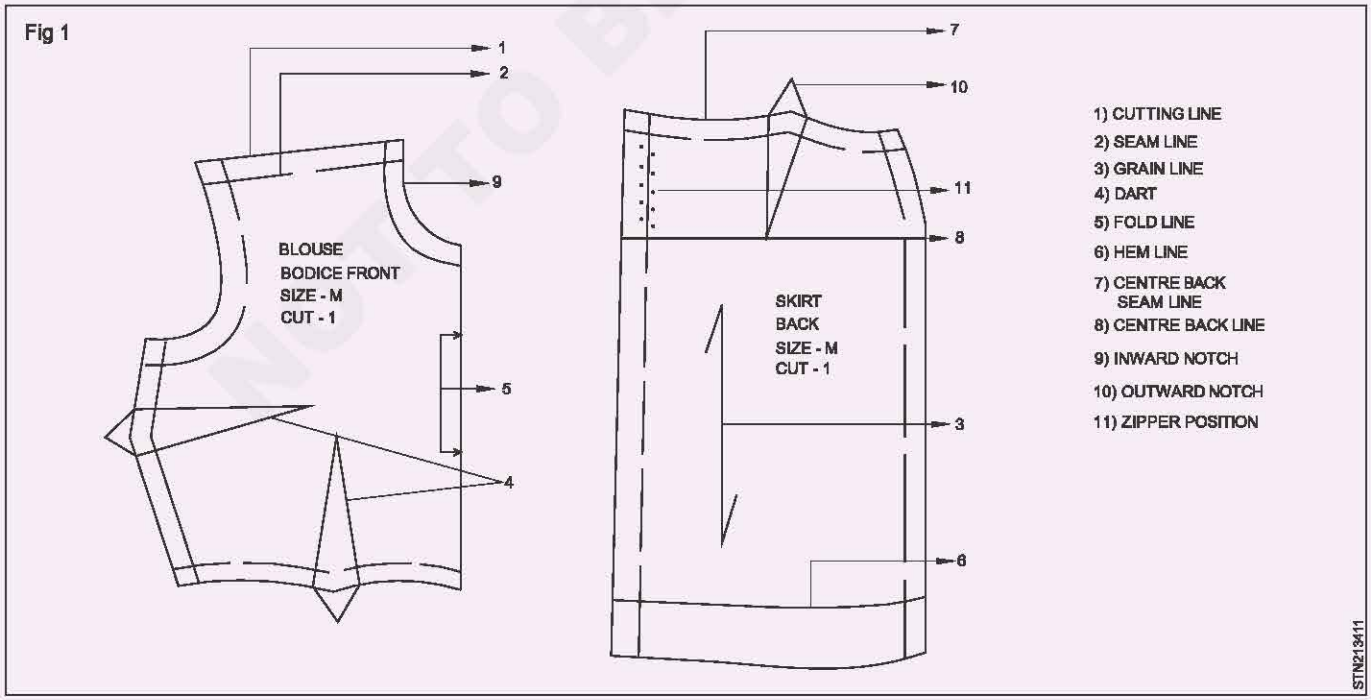
2 Draping method

3 Flat pattern designing.

**1 Drafting Method:-**

Drafting method needs actual required measurements. With the help of the body measurements, we have to use proper pattern making tools like 'L' square and French curve and draft the required patterns. This is accurate method.

Fig 1

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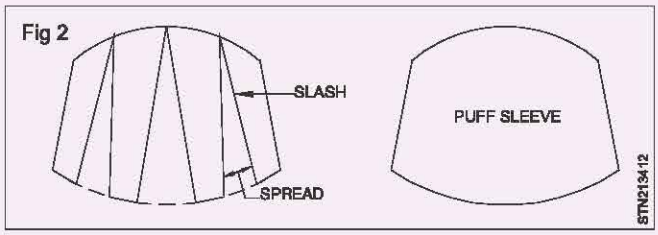
**2 Draping method:-**

In draping method, we have to drape the actual fabric on dress forms and we have to pin it at the required style lines, and we have to cut the extra fabrics on each body style line like shoulder line, neck line, arm hole etc. After completing the process the fabric is removed from the dress form and with the cut fabric the patterns have been traced. It consumes lot of fabric and line. And this is an approximate method.




**3 Flat pattern designing:-**

Making one pattern with the help of existing pattern is called as "Flat pattern designing". There are two types of techniques.

**1 Adaptation:**

Adaptation is the method of creating a basic style pattern from the block pattern. (e.g.) Basic sleeve pattern from Sleeve block.

**2 Manipulation:-**

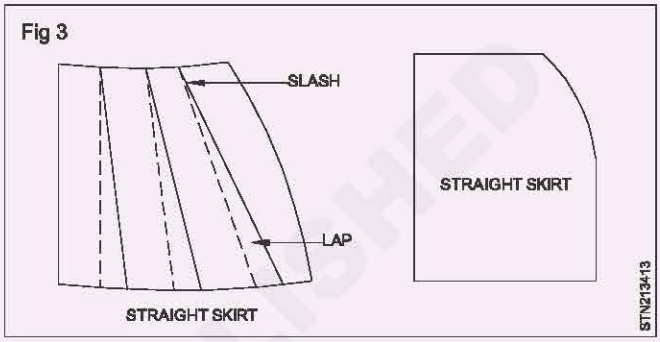
Manipulation is the method of converting one style pattern to as other style pattern, (e.g.) plain sleeve to puff sleeve. In manipulation technique there are two methods are normally used. They are

i Slash and spread method.

ii Slash and lap method.

In slash and spread method, the pattern has been slashed into required no of equal parts and spread on a paper. And the new pattern has been created with the outline marking of the spread patterns. (e.g.) Plain sleeve to Puff sleeve.

In slash and lap method, the pattern has been slashed into required no equal parts and lap over one above the other. And the new pattern has been created with the outline marking of the spread pattern. (e.g.) Flared skirt to a straight skirt.




## Spreading

**Objective:** At the end of this lesson you shall be able to
- **explain about spreading and its methods.**

**Spreading:** The Process of arranging the fabric one layer above the other layer for mass production is known as "Spreading".

**Importance of Spreading**

In mass production, it is difficult to cut each and every single piece for stitching process. For that, the fabrics are arranged layer by layer, one above the other, the patterns are laid on it, the outlines of the patterns are marked by marking chalk and finally cut by using a cutting machine. This method is used to save the precious time and used to follow the uniformity in all the cut components. Also, by this method, the fabric consumption per garment is minimized and fabric waste is reduced a lot.

This process of arranging the fabric one above the other, layer by layer, is called as "Laying" or "Spreading" Process. The arrangement of the fabric one above the other for mass cutting is called as "Lay". The arrangement of the patterns on the fabric lay is known as "Lay out" or "Pattern Layout". The marked pattern layout on the fabric lay is called as "Marker". The length of the lay is known as "Lay length".

**Methods of Spreading**

The Spreading can be done by the following two methods, which are followed in Industries.

a Manual Spreading or Spreading by Hand

b Machine Spreading or Spreading using a traveling machine - Spreading Machine.

**a Manual Spreading.**

This is the commonest method followed in the garment Industries in India. Here, the operator spread the fabric manually without using the machine. It is a time consuming method requiring an operator at each side of the table. Here, the operator lays the fabric from one end of the long cutting table to the other where the ends are secured by dead weights. The operator works back from the end aligning the edges and ensuring that there is no tension.

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They are also removing the wrinkles by using a long stick. They cut the ply normally with hand shears. Now, in Industries, an instrument called "Ply Cutter" is used to cut the fabric ply. During spreading, they are aligning the fabric selvedge at one side to avoid the width variation. They are also arranging the lengthwise and widthwise design lines to perform the line matching in the case of striped and checked fabrics.

### b Machine Spreading

Spreading machines are normally used in foreign countries, which will automatically carry out the spreading operation without manual support. Their basic elements consist of a frame or carriage, wheels traveling in guide rails at the edge of the table, a fabric support, and guide collars for unrolling of the fabric. In advanced machines there is a motor to drive the carriage, a platform on which the operator rides and a ply-cutting device, which are used to perform the spreading operation. There is a ply counter is used to know the number of layers laid and a turntable is used to turn the fabric roll. We can use the machine for fabrics having width from 2 m to 3m. The maximum weight of cloth roll that can be carried by the larger spreading machine is 120 Kg. The maximum spreading speed around 100 m/min and maximum height of spread cloth is 28 Cms. When a spreading machine delivers fabric when traveling in one direction but returns to the first end without spreading to begin the next lay, the return pass is known as Dead heading. Many spreaders will travel at a higher speed when deadheading. Heavy piece machines are usually automatic; incorporating specialized breaking facilities and stop motion devices (Fig 1).

Fig 1

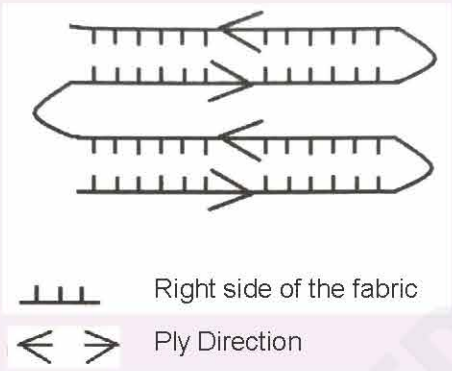
### Types/Forms of spreading

There are four types of spreads or forms of spread. We can choose the suitable type according to the fabric type. These four types are shown in figures and the ply direction and right side of the fabric are also shown in the figure.

### a Type 1 - Zigzag method

By this method, we can arrange or spread the fabric in a zigzag manner with folding at the both ends. In this type, the right side and the wrong side of the fabric layers are facing the right side and wrong side respectively. This is suitable for the fabrics which are not having the right and wrong side difference and also for double side printed fabric (Fig 2).

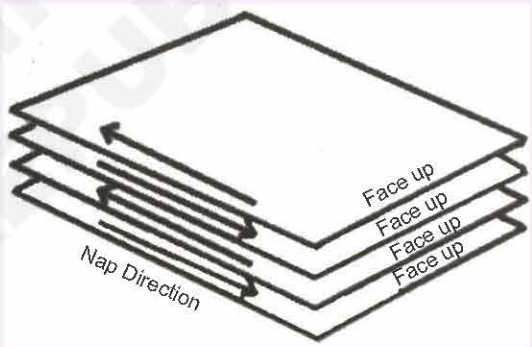
Fig 2




### b Type 2

In this method, the spreading is done similar to zigzag method, but the fabric is cut at the ends and turned such a way that all the right sides of the layers are facing wrong sides. This type is suitable for one side fabric and one side fabric (Fig 3)

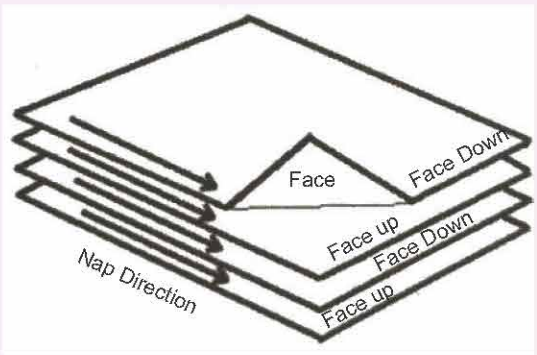
Fig 3




### c Type 3

This type is suitable for one-way fabrics, which are not having right side and wrong side difference. In this type, the done at the same direction as shown in the figure. The fabric is laid from one side to other and cutting the fabric at the previous end. Here, the right side and wrong sides layers of the fabrics are facing right and wrong side repectively (Fig 4).

Fig 4

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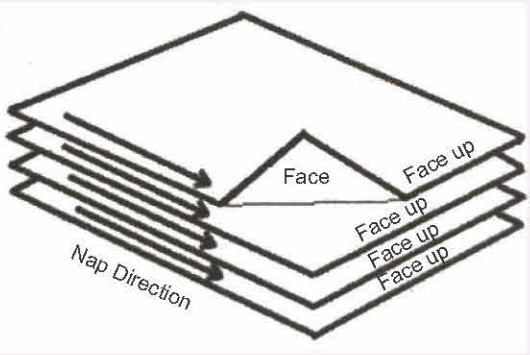
**d Type 4**

This type is simillar to type 3, but the fabric is being turned before starting the next lay. Here, all the right sides of the fabric layers are facing the wrong sides. This type is suitable for one way and one side fabric (Fig 5).

Fig 5




**Types of Lay**

The following are the different types of lay. They are,

1 Single pick lay

2 Double pick lay

3 Deficient lay

4 Multiple lay

5 Stepped lay

**1 Single pick lay**

Lays are called as "single pick lays" when each and every component is picked up individually from the cut blocks. This is the commonest type of lay.

**2 Double pick lay**

In this type, the fabric is laid in folded condition and the cut components are picked up in double. In case of shirts using checked design fabrics, the fornt and back parts are cut as square blocks and the cut blocks are again laid in folded form with design line matching. Then the patterns are placed on the lay, makred and cut by using machine. After cutting, we have to pick double pieces as pair for each garment. Hence it is called as "Double pick lay".

**3 Deficient lay**

In order to make the optimum use of end pieces of the fabric in mass cutting, lays are prepared with a few components deficient. For instance, in case of shirt, the main lay is prepared with leaving few components suc as cutt, collar etc. Such a lay set wit hdeficient components is called as "Deficient Lay". A separate lay is made for the deficient parts using end pieces or lay balance of the fabric. Normally the inside parts of the garment are cut using deficient lay.

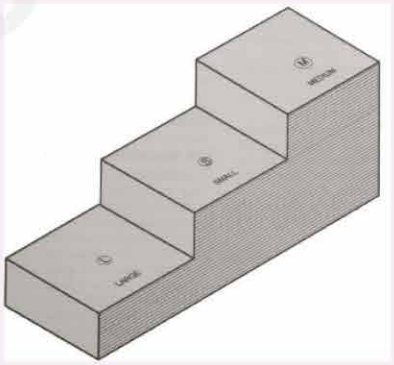
**4 Multiple lay**

Lays are called as "Mulitple lays" when the same are set for more than one unit. In order to effect economy, lay of two garments or three garments are set to effect optimum utilization. When we increase the unit of garments per lay length the fabric consumption per garment is gradually reduced.

**5 Stepped lay**

According to the size quantities we can lay different length lays one by one for quick cutting. These types of alys are called as "Stepped lay" because they form in a stepped manner. But, when using stepped lays, we have to consider the size quantities because, we are cutting all the lays at the same time. The form of "Stepped lay" is shown in the following figure (Fig 6).

Fig 6



## Pattern layout

**Objective:** At the end of this lesson you shall be able to

- **explain about pattern layout.**

**Pattern layout:** The arrangements of patterns on a fabric is known as "pattern layout".

**Work and safety precautions for creating and cutting the paper pattern:** The measurements are to be finalised before drafting the pattern on paper. Incomplete measurement information may lead to confusion.

The working area of the pattern draft must be wide enough to accommodate the required pattern to avoid patching up the paper and measurement error.

Attention must be given while applying the correct measurements on drafting the pattern.

All the lines (seam lines, fold lines, dart lines etc.) of the draft should be distinctly clear, to avoid incorrect cutting.

All the incorrect lines have to be erased in order to avoid confusion and subsequent damage.

After drafting, all the measurements have to be checked to ensure accuracy. In cutting the drafted pattern, the outside edge of the seam line has to be followed.

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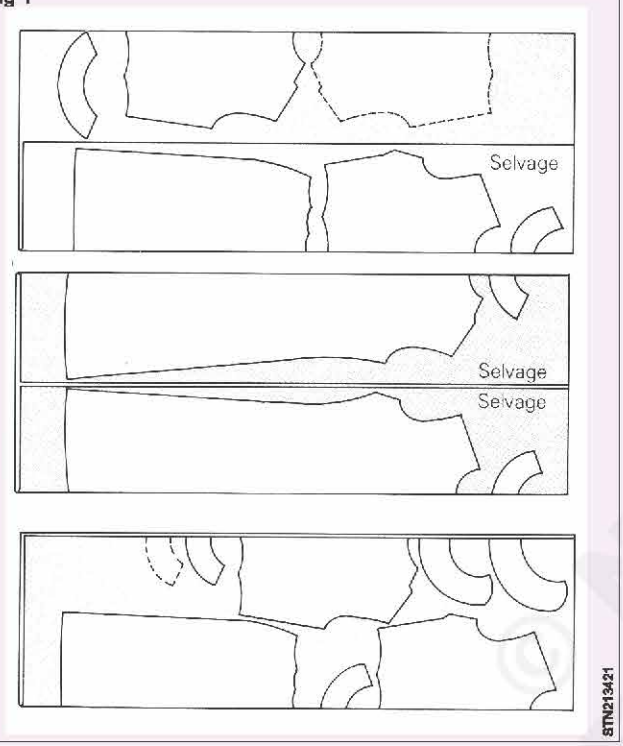
The notches are to be made wherever the seam line and fold line occur.

**Layout:** The layout shows the placement of components in an economic way. Generally, the components have to be laid out on the grains that means in warp direction of the fabric weave.

Only in some cases, parts have to laid out on the bias grain that means crossing the warp grains at an angle of 45 degree. This information is indicated by an arrow on each component in the graphic for layout. (Fig 1)

Fig 1




Further, you find information on plain or folded fabric and size. Fold width wise means to fold the material along the weft line, i.e. the fold will appear in width wise direction but will part the length of the material. Fold length wise means that to fold the material along the warp line, i.e. the width of material is folded parallel to the selvedge.

Always take care to layout the components on the direction indicated by grain line marks. Otherwise, the material will stretch after washing. Generally three types of layout are distinguished

– Layout on lengthwise fold (Fig 2)

– Layout on widthwise fold (Fig 3)

Fig 3

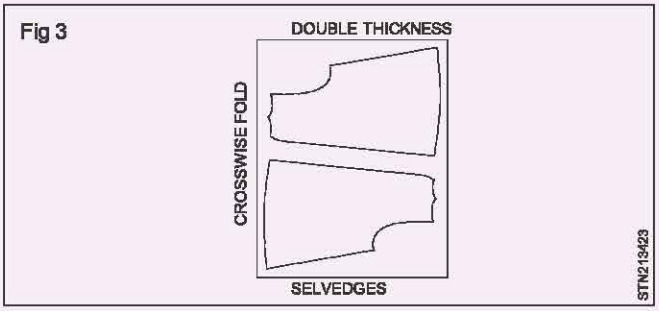
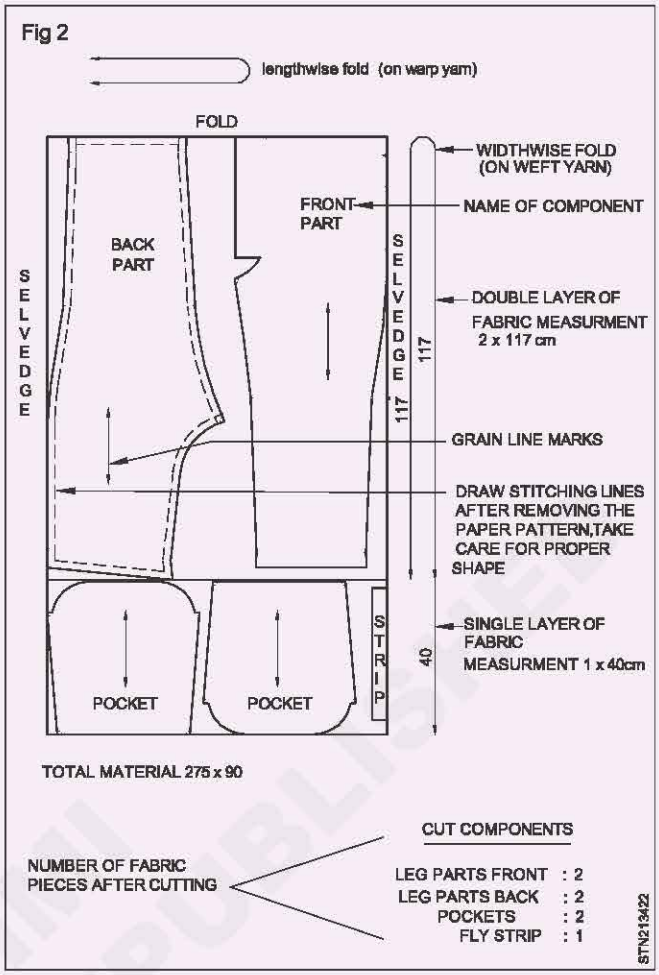
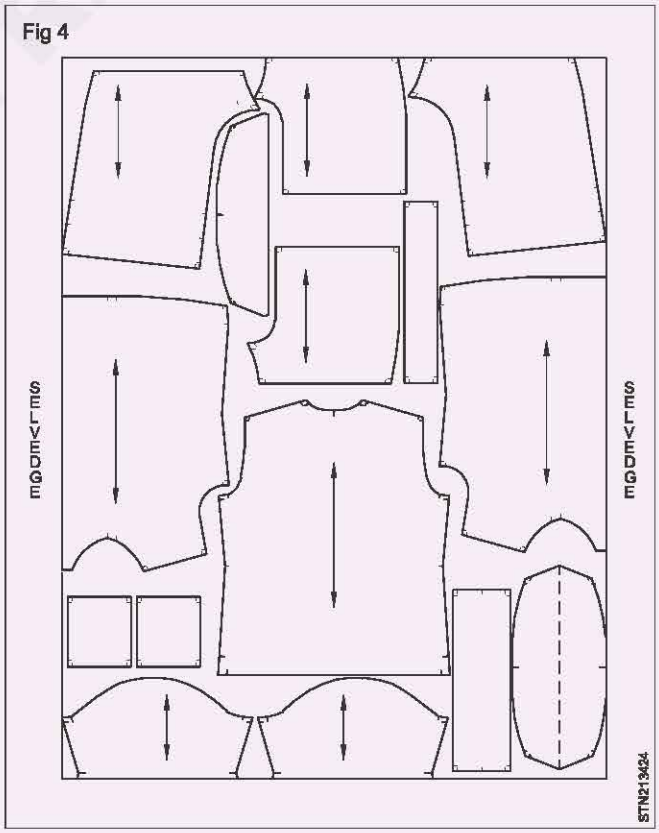



Fig 2




– Open layout (whole garment lay (Fig 4)

Fig 4




– Directional layout (one way layout) (Fig 5)

Fig 5

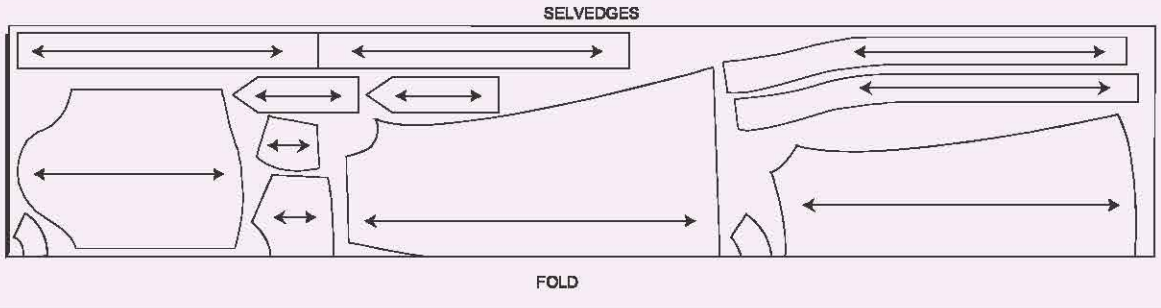
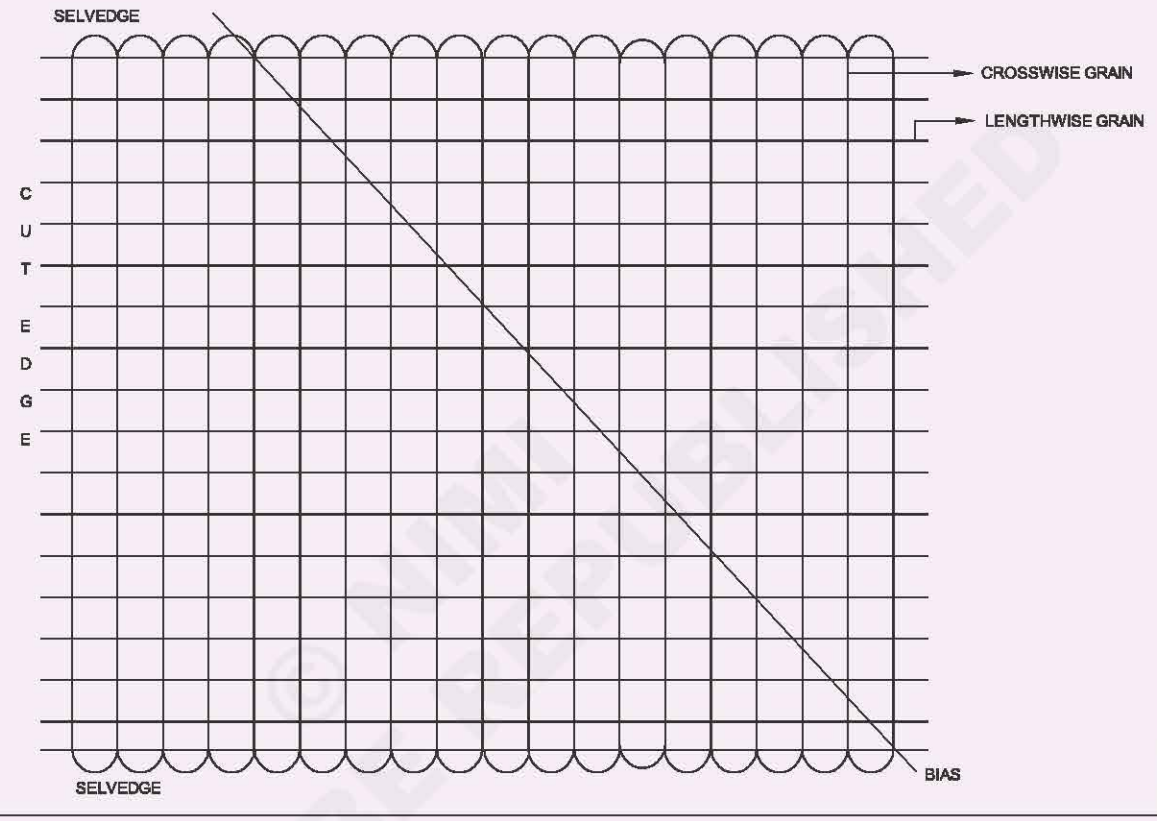



Fig 6




Below the layout, the number of cut components is given after cutting the fabric. For example one pattern component will result in two cut components in case of the double layered fabric. This gives a better overview, whether all the components are available after cutting. Therefore, you should not forget to count the components before you start stitching. Identical components (sleeves for example) are normally drawn only once but used twice in the layout on cloth. Only in case you have to find out the appropriate layout by yourself (since you work on different width of fabric) you have to draw all components so that you can find out the appropriate layout by trial (open layout or whole garment lay).

**Precautions for layout:** Care has to be taken to check that all the pattern pieces are laid out on the fabric. The missing pattern piece might result in the incompletion of the garment.

The main and large sections are placed with their wide ends at the cut ends of the fabric first. Then the small pieces are fitted to the best advantage. Non-observance might cause shortage of fabric. It has to be ensured that the grain lines of the cut pattern are exactly placed according to the grain line in fabric. The error may cause incorrect alignment and bad look of the garment.

While working with nap and pile fabric (velvet and corduroy) as well as one-way designs the components have to be placed in one direction. Otherwise, it causes serious shade difference in the garment.

The outer edge of the laid patterns has to be drawn, traced, stuck, clipped or pinned accurately before cutting the fabric. Even any minor error may damage the shape of the garment.

The cutter may walk around the cutting table as he cuts, in order to prevent shifting of the grain lines and thereby uneven edges. Steady, slow and correct cutting is always better than fast and haste incorrect cutting, or in order to avoid multiplicity of errors.

### Pattern terminology

1 **Mass Production:** The bulk manufacturing of readymade garment with standard measurement is known as mass production.

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2 **Pattern :** Pattern can be defined as a model or replica of various components of a Garment. It can be made using paper, plastic, metal etc. Normally, the patterns are prepared using Paper which is cheaper and easily available. Hence it is also called as Paper Patterns.

3 **Commercial Patterns:** Patterns prepared on the basis of Standard Measurements or Readymade measurements.

4 **Personal Patterns:** Patterns prepared on the basis of Individual or Personal measurements.

5 **Pattern Making:** The method of creating patterns is known as pattern making patterns can be made by using drafting method or draping method or by flat pattern designing method.

6 **Pattern drafting:** The system of pattern making depends on measurements taken from a dress form all model is known as pattern drafting method.

7 **Draping method:** The method of pattern making in which the muslin fabric is trapped on a dress form is known as dropping method.

8 **Flat pattern designing:** This is the 3rd method of pattern making in which the pattern of one style is modified into the pattern of another style using slash and spread method or slash and lap method eg:- Plain sleeve pattern can be modified into puff sleeve pattern by using slash and spread method.

9 **Block Pattern:** The basic patter which resembles the enact body shape and figure without any style features and seam allowance is known as the block pattern the block pattern is also called as basic pattern or master pattern or slope pattern or foundation pattern.

10 **Basic Pattern set:**

The five blocks named body's front, body's back, sleeve, skirt front and skirt back is known as basic pattern set.

11 **Working Pattern:** The traced copy of block pattern for manipulation to create new design is known as working pattern.

12 **First Pattern:** The Original pattern developed for each design is known as first pattern, normally half of the pattern is developed for bodies and the first pattern requires fitting and adjustment.

13 **Production pattern:** The Production pattern is a pattern set that has been corrected and perfected and contains every patterns required to complete the garment eg:- the production pattern of a gents shirt.

**Contains**

Front - 2 No's

Back - 1 No's

Yoke - 2 No's

Half sleeve - 2 No's

Pocket - 1 No's

Collar - 2 No's

Collar band - 2 No's

14 **Graded patterns:** The production pattern is graded into different required sizes and the prepared patterns are called as graded patterns.

15 **Marker:** The marked patterns layout on fabric or paper is known as marker.

16 **Spec-sheet [Specification sheet]:** The spec sheet is a record of finishing requirement for a garment design it contains the entire design features and sewing instruction of a garment for production.

17 **Pattern Chart:** Pattern chart is a complete record of all pattern pieces with in the pattern set it also includes stitches and the pattern information.

18 **Cost sheet:** A cost sheet is a complete record of each design and is used to cost the garment and establish the whole sale price sheet should contain all the materials with their consumption details with individual price for calculating the prize of the garments.

19 **Pattern paper:** The special papers which are used to create patterns in garment industries is known as pattern paper they are available in different specifications and each paper supplier uses accord system to indeed the range of paper weights available the heaver pattern paper are commonly refer to as tag brand, manila or hand paper where as the lighter weights are called marking paper. Their proper coding and common usage as follows 1* Granite Tag (0.007) to 5* Granite tag (0.019)

20 **Bust Point:** A designated place on the bust and pattern is known as bust point and referred to in flat pattern making as the pivoted point or apex.

21 **Dart:** A wedge shape contour in a pattern to control the fit of a garment is known as dart.

22 **Dart legs:** Dart legs are the two lines that falls at a predetermined point on the pattern.

23 **Dart intake:** The amount of excess all space confirmed between dart legs is known as dart intake.

24 **Blending:** The process of smoothing shaping and rounding angular lines allow a seam for a smooth transition from one point to the next is known as blending.

25 **Tureing:** The blending and straightening of pencil line cross mark and dart marks for the purpose of establish correct sewing lines is known as trueing process.

26 **Muslin:** A plain woven cotton fabric made from bleached or un bleached yarns in variety of weights is known as industrial fabric it is normally used for draping or pattern alteration process.

27 **Grain:** The direction of yarn in a fabric is known as grain.

28 **Warp Grain:** Yarns parallel which selvedge and right angles to the 10cft grain is known as warp grain it is also called as length wise grain.

29 **Weft Grain:** Yarns woven a cross the fabric from selvedge to selvedge is known as weft grain it is also called as cross wise grain.

30 **Selvedge:** The narrow firmly woven and finished strips are both warp grain edges of the woven fabric is known as selvedge clipping selvedge relies tension.

31 **Bias :** A slap ding or diagonal line cut or a cross the view of the cloth's known as bias.

32 **True Bias:** The angle line that intersects with the warp and weft grains at a 450 angle is known as true bias. Frills, Cowls and tiers work best when cut on true bias.

33 **Bowing and Skewing:** Fabric grains that are not at true right angle causes the fabric effect bowing, skewing or a combination of both. This is a result of stress and strain imposed while the process of weaving or finishing.
(ADD figures of Bowing and Skewing. Fig Nos. GAR143T1003 & GAR143T1002)

34 **Pin Marking:** Placing a series of pin through the muslin or dress form to evaluate style line placement is known as pin marking it is used in draping process.

35 **Tape Marking:** Style line placement by tape to evaluate design feature and provide a guide while developing pattern is known as tape marking. It is used in Draping process.

36 **Balance:** The perfect relationship between parts of a garment which all are combined to form a unit in which each part is in exact proportion and harmony with the other is known as balance.

37 **Balancing a Pattern:** Finding to adjust the differences between joining patterns parts to improve the blend and fit of the garments. It known as balancing a pattern.

38 **HBL (HORIZONTAL BALANCE LINE):** A reference to any line marked around the form that is parallel in the floor is known as horizontal balance line. The HBL line is used while balancing the patterns.

39 **ASTM Standard:** ASTM is AMERICAN SOCIETY for TESTING and MATERIALS. It fixes norms and standards for textile and garment industry to execute the process with quality and perfection.

40 **AAMA:** AAMA is AMERICAN APPARELS MANUFACTURERS ASSOCIATION which like ASTM. They are also having norms and standards for garment industry.

41 **Symbol keys:** Symbol keys are the short forms of measurement used in pattern drafting.
CF - Centre Front
CB - Centre Back
BP - Bust point
SS - Side seam
SW - Side waist
SH - Shoulder
HBL - Horizontal balance line
SHTIP - Shoulder tip.

42 **Pattern Plot:** The act of placing line on a traced copy of the working pattern relating directly to the design feature is called as pattern plot. The lines are used as guide lines for pattern manipulation.

43 **Pattern Manipulation:** The act of slashing, spreading, pivoting a pattern section to alter the original shape to new pattern shape which represents design feature of garment.

44 **Design Pattern:** The finished pattern that contains all the features reality to the designs known as design pattern.

45 **Test Fit:** After completing the design pattern, the design should be cut in a woven fabric an placed on a dress form or model for a test fit. One half of the garment is needed when fitting the form.

46 **Panel:** For pattern manipulation a pattern can be divided into equal or unequal parts. Each part can be defined as panel.

47 **Gore:** The wedge shaped or triangular panel is called as gore.

48 **Yoke:** In pattern manipulation, if a pattern is divided into two pieces horizontally then the small potion is called as yoke.

49 **Adaptation:** Adaptation can be defined the method of manipulating a block pattern in to its basic style.
Example: Skirt block into basic skirt pattern, Sleeve Block into basic sleeve pattern, Shirt Block into basic shirt pattern, etc.

50 **Manipulation:** Pattern manipulation can be defined as the process of modifying a basic style pattern into a new style pattern.
Example: Basic straight skirt pattern into gored skirt pattern, Basic plain sleeve into puff sleeve, Basic shirt pattern into classic shirt pattern or (model shirt), etc.

51 **Design:** Design is a diagrammatic representation of a Garment.

52 **Style:** This is a design variation of a garment. Ex. Shirt is a garment. Full sleeve shirt, half sleeve shirt, Shirt with Single Pocket, Shirt with double pocket are known as styles of shirt.

53 **Notch:** It is an identification marks used in pattern for balance.

54 **Ease Allowance:** The allowance which is added along with the real body measurements for Comfort is known as Ease Allowance. Other types of allowances are Loose Allowance, Seam Allowance, Folding Allowance, Shrinkage Allowance & Fullness allowance.

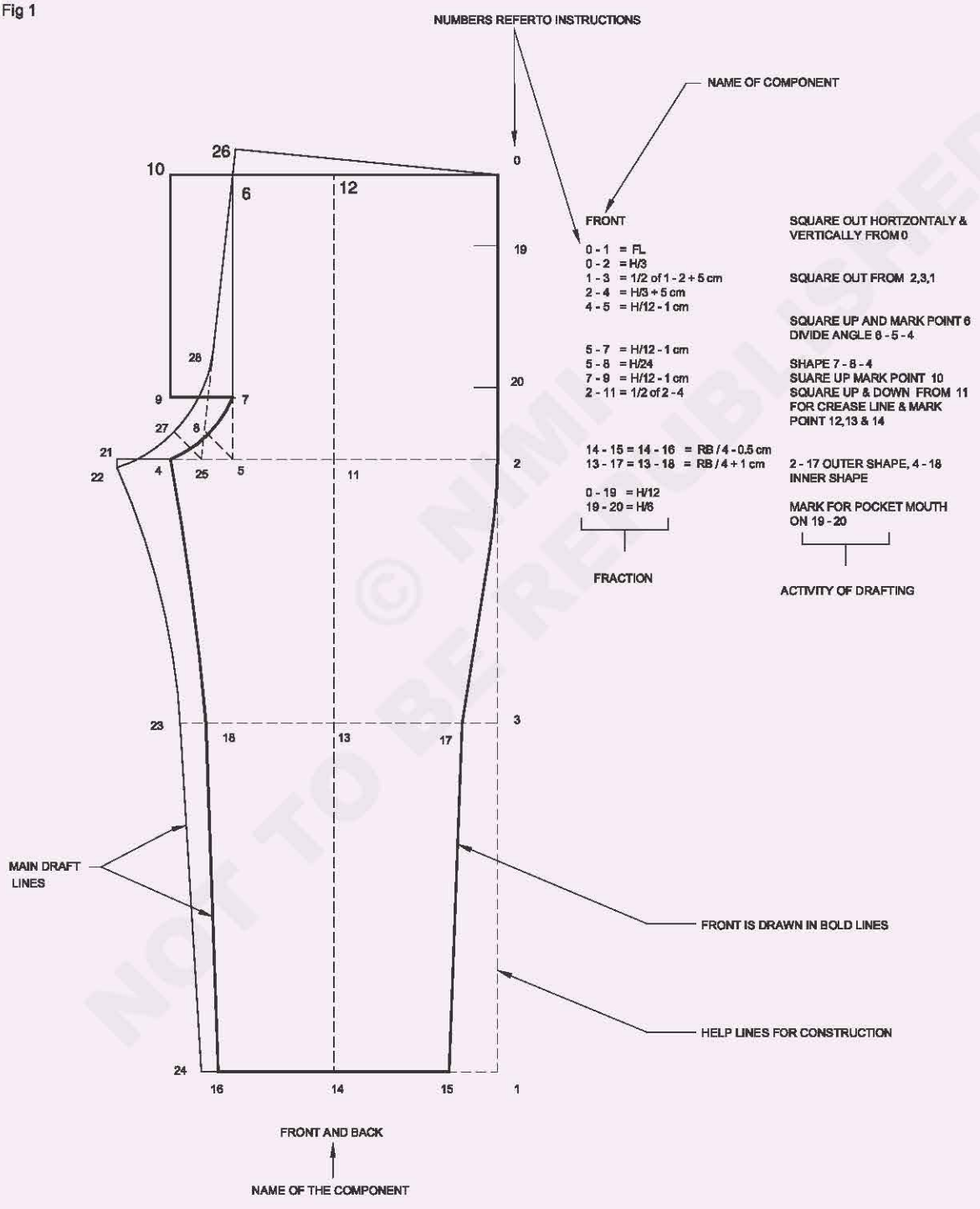
# Principle of pattern drafting

**Objectives:** At the end of this lesson you shall be able to

- **explain the draft for a paper pattern**
- **name pattern working and safety precautions while creating and cutting a paper pattern.**

**Pattern construction:** Pattern construction is one of the most complicated activities in dress making. A pattern is a diagrammatic representation of the way a garment is constructed. Paper pattern is a permanent record and is used several times. From the basic paper pattern, various designs can be achieved easily. Using a paper pattern saves time and material.

Fig 1


NUMBERS REFERTO INSTRUCTIONS
NAME OF COMPONENT
FRONT
0 - 1 = FL
0 - 2 = H/3
1 - 3 = 1/2 of 1 - 2 + 5 cm
2 - 4 = H/3 + 5 cm
4 - 5 = H/12 - 1 cm
5 - 7 = H/12 - 1 cm
5 - 8 = H/24
7 - 9 = H/12 - 1 cm
2 - 11 = 1/2 of 2 - 4
14 - 15 = 14 - 16 = RB / 4 - 0.5 cm
13 - 17 = 13 - 18 = RB / 4 + 1 cm
0 - 19 = H/12
19 - 20 = H/6
FRACTION
SQUARE OUT HORTZONTALY & VERTICALLY FROM 0
SQUARE OUT FROM 2,3,1
SQUARE UP AND MARK POINT 6 DIVIDE ANGLE 6 - 5 - 4
SHAPE 7 - 8 - 4
SUARE UP MARK POINT 10
SQUARE UP & DOWN FROM 11 FOR CREASE LINE & MARK POINT 12,13 & 14
2 - 17 OUTER SHAPE, 4 - 18 INNER SHAPE
MARK FOR POCKET MOUTH ON 19 - 20
ACTIVITY OF DRAFTING
MAIN DRAFT LINES
FRONT IS DRAWN IN BOLD LINES
HELP LINES FOR CONSTRUCTION
FRONT AND BACK
NAME OF THE COMPONENT
CT121311

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Always draw the pattern from wrong side of the brown paper.

The paper pattern for each garment will be drawn always with the help of the small graphic given in each exercise and with the help of the **instructions for drafting** which you will find beside or below the graphic. (Fig 1)

The numbers in the instructions for drafting refer to the numbers in the graphic, so that you can draft an enlarged version of the paper pattern according to the size desired.

The first column of the instructions gives the **fractions**, i.e. a general measurement which can be transferred to any size, e.g. hip/8.

Measurements given in fractions as "cm" might have to be adjusted. For example:hip/8 + 2 cm will indicate some ease to hip size. These 2 cm ease have to be adjusted if you stitch for a bigger or smaller size than given in the book. This needs of course, some experience.

Abbreviations used in fractions are listed below.

| Abreviation | Body measurement |
|---|---|
| NW | Natural waist |
| FL | Full length |
| Sh | Shoulder |
| SL | Sleeve length |
| SB | Sleeve bottom |
| Ch | Chest |
| B | Bust (Ladies'garment) |
| W | Waist |
| H | Hip |
| N | Neck |
| ACh | Across chest |
| AB | Across back |
| BL | Bust level |
| LL | Leg length |
| ILL | Inner leg length |
| KnL | Knee length |
| BR | Body rise |
| RKn | Round knee |
| RC | Round calf |
| RB | Round bottom |

The second column describes the **activity of drafting**. For example: "join" means to draw in straight line, "shape" means to draw in a curved line (here 3 points are given to indicate the depth of shape). "Square out (down) from .." means that you have to draw an horizontal or vertical line where a point will be set on in the next step.

The graphic shows all the components of the pattern which are required for the garment. The continuous lines are main draft lines, the dotted lines are help lines for construction.

Sometimes the front and back part of a garment is shown in one graphic. While converting the graphic into a paper pattern these parts have to be drawn separately. For easier identification the front part is shown with a bold line.

Since, the front part of the body is more prominent than the back (bust, tummy), the length of the front pattern is to be increased. This is shown in all front patterns.

The draft normally shows only a quarter or half of the full garment. This influences either the number of layers on which you draft the pattern or the layout on cloth. For example: If there is given only half the component of back you can draw the component on a folded brown paper, centre line of component on fold of paper. Or you can draw half the back component and use it twice while placing it mirrorwise on the centre line. Instructions are given in each exercise. The draft shows the components of the pattern without any allowances. They will be added later in the master pattern.

While drafting the components on the brown paper, sufficient space for allowances in master pattern has to be provided between them. Generally 5 cm will be sufficient, but in some cases more space will be required. This you can check up with the help of instructions for master pattern.

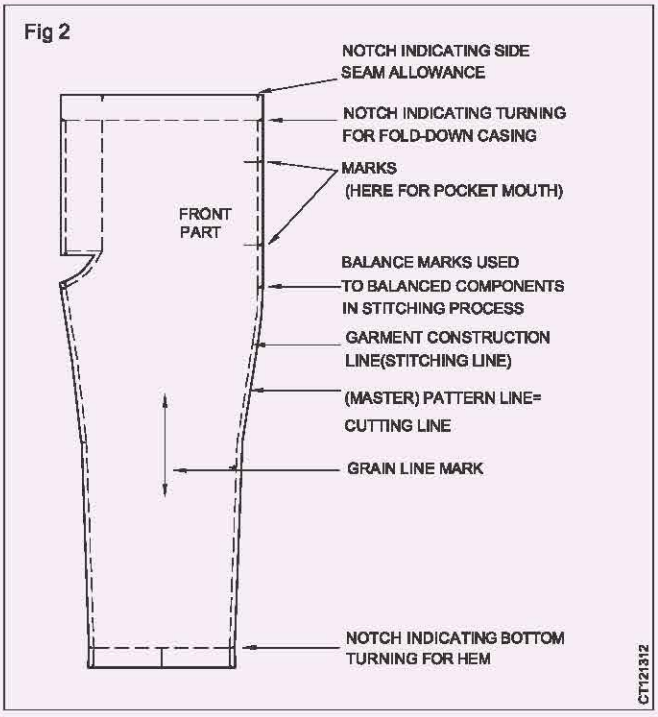
The **master pattern** includes all the allowances for seams, turnings, inlays etc. This pattern shape will be laid out on cloths and cloth will be cut accordingly.

The allowances for seams, turnings, facings etc. have to be added to the basic pattern construction. They will be indicated by 2nd line but also by notches which are cut into seam allowance. (Fig 2)

Notches are also indicating balance marks, which are used during stitching process to ensure the balance of two components. They have to be set on

- Centre of neck and collar
- Centre of front and back component
- Facings
- Sleeve crown

Fig 2


NOTCH INDICATING SIDE SEAM ALLOWANCE
NOTCH INDICATING TURNING FOR FOLD-DOWN CASING
MARKS (HERE FOR POCKET MOUTH)
FRONT PART
BALANCE MARKS USED TO BALANCED COMPONENTS IN STITCHING PROCESS
GARMENT CONSTRUCTION LINE(STITCHING LINE)
(MASTER) PATTERN LINE= CUTTING LINE
GRAIN LINE MARK
NOTCH INDICATING BOTTOM TURNING FOR HEM
CT121312

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- Sleeve bottom and sleeve band
- Waistline / hipline
- Kneeline / calfline / bottomline
- Sections of waist band and applied casing
- Attached components
- Pocket mouth
- Placket
- Darts
- Pleats.

The master pattern will be laid on cloth and the cloth will be cut accordingly. The stitch lines have to be drawn on the cloth after the notches are transferred to cloth and the pattern is removed.

It is also possible to transfer the pattern component on the fabric without seam allowances and to add the seam allowance directly on the cloth. But be careful to provide sufficient space between the components!

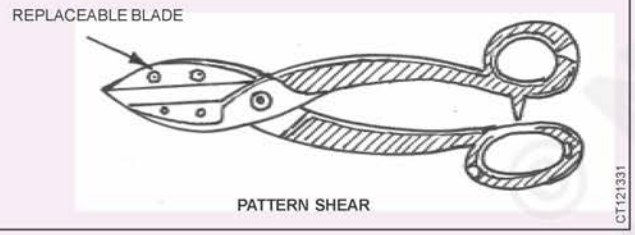
## Tools for pattern making

Objectives: At the end of this lesson you shall be able to
- **explain the different tools used for pattern making.**

**Supplies for pattern making:** Besides **paper cutting scissors** and pins some other equipment is also required to create a paper pattern.

**Pattern scissor** have long and strong contoured handles with strong replaceable blades. They are used for cutting out pattern templates from thick cardboard or pattern paper. (Fig 1)

Fig 1




**Notches** are cut with a notcher used for positioning marks on patterns. Example: balance marks, seam allowances, center lines, ease and dart marks etc. (Fig 2)

**Brush** with soft bristles is used to remove construction lines drawn on cloth.

**Pattern drafting paper or brown sheet** is a thick white or brown paper of good quality. It is used to draft garment design and to cut parts of the garments patterns, e.g. front, back, sleeve, collar, cuff etc. (Fig 3)

**Cutting table** with 180 cm length, 120 cm width and 100 cm height can be conveniently used for spreading the layout and cutting the fabric.

Fig 2

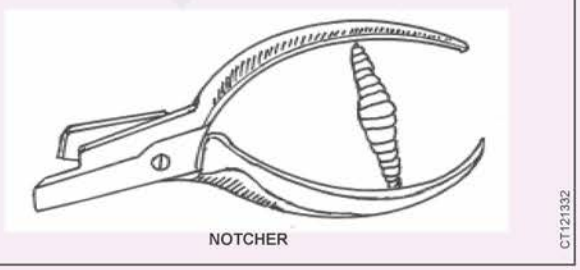
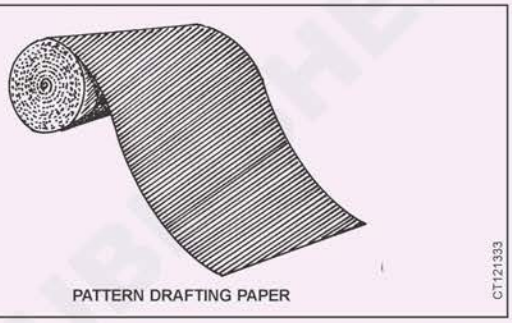



Fig 3

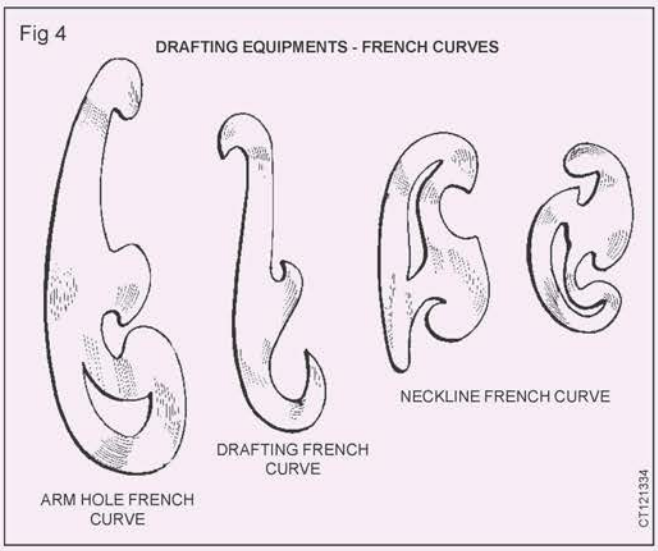



**Drafting tools:** To work efficiently, one should have the proper tools and supplies. To communicate effectively and to minimise errors, one should know and understand the terms for tools commonly used in drafting. The drafting tools simplify the drafting process.

**French curves** are made of plastic or wood and available in different shapes and sizes. They are used for shaping armholes, waist, sleeve and necklines. (Fig 4)

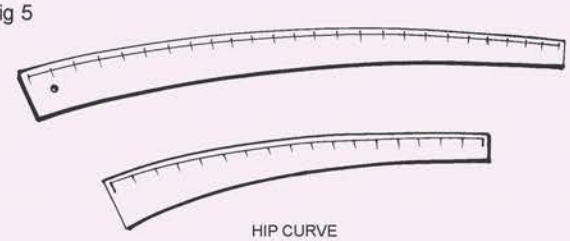
Mechanical pencil and sharpener are ideal for pattern work. Use 2-H for drawing patterns and 4-H for manipulation of patterns. Use red and blue lead and washable felt tip in black, green and blue for practicing on white or brown paper.

Fig 4



**Curve ruler or Leg shaper** (Hip curve) is mainly used for drawing inside leg shape for pants, payjama and shorts. It is also used for hip shapes, bottom shapes, elbows and lapels. (Fig 5)

Fig 5

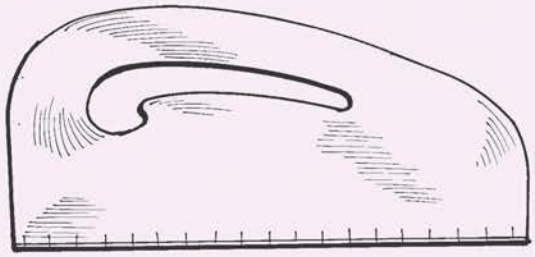


HIP CURVE

CT121335

**Pattern square** is generally made of light metal or synthetic material or of wood. Its special feature is the curved edge. It is used in the design and pattern for drawing curved lines, e.g. hip, collars. (Fig 6)

Fig 6

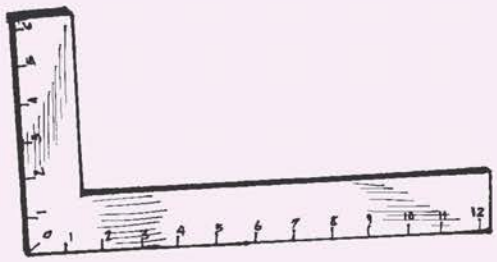


PATTERN SQUARE

CT121336

**Tailors' square** is also called as 'L' square, mostly made of wood and it is 'L' shaped. The long arm is generally 61 cm and the small arm is 30.5 cm long. It has a scale on both the sides. Some of the scales are marked with divisions like 1/2, 1/4, 1/8, 1/12 & 1/16. (Fig 7) It is used for drafting garments.

Fig 7



L. SCALE

CT121337

Tape measure, tailors chalk, awl, pencils, pins etc. are also required for pattern making.

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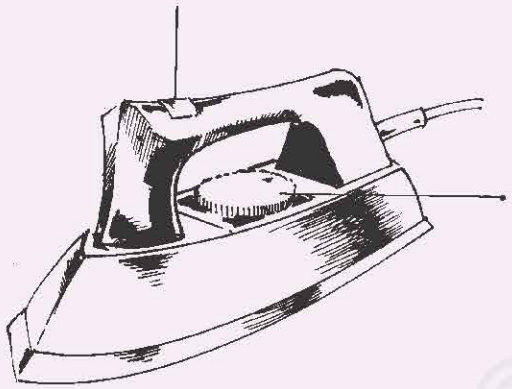
# Pressing

**Objectives:** At the end of this lesson you shall be able to
- **name the pressing equipment and its application**
- **explain the importance of pressing.**

### Pressing equipment

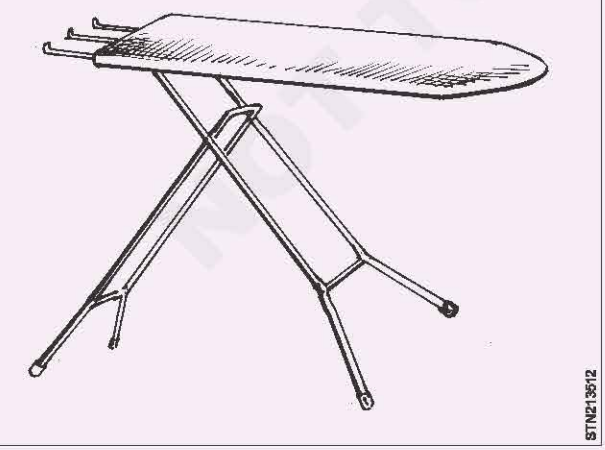
**Electric iron:** It is specially shaped with pointed nose and parallel sides. The bottom plate of the iron is heavy, hard and smoothly polished, so as to allow easy movement on the fabric to be pressed. It is provided with a non-conducting handle and a temperature regulator or a thermostat. (Fig 1)

Fig 1



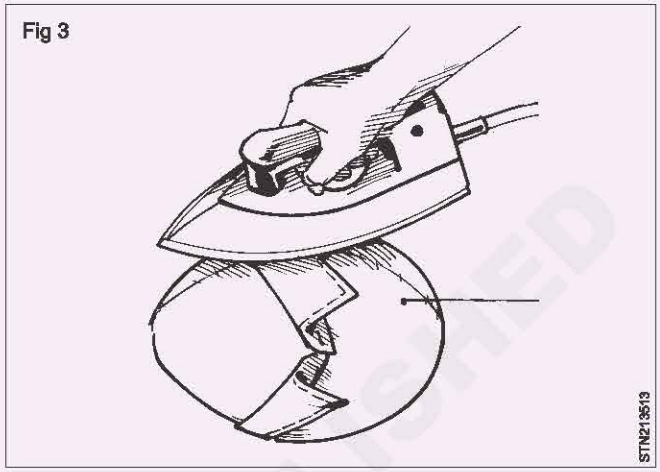

**Ironing board/pressing table** (foldable)**:** It is a flat, hard board, made of either wood or metal. The board is stuffed with cotton and covered with cotton fabric and it is fixed on an adjustable stand to vary the height. (Fig 2)

Fig 2



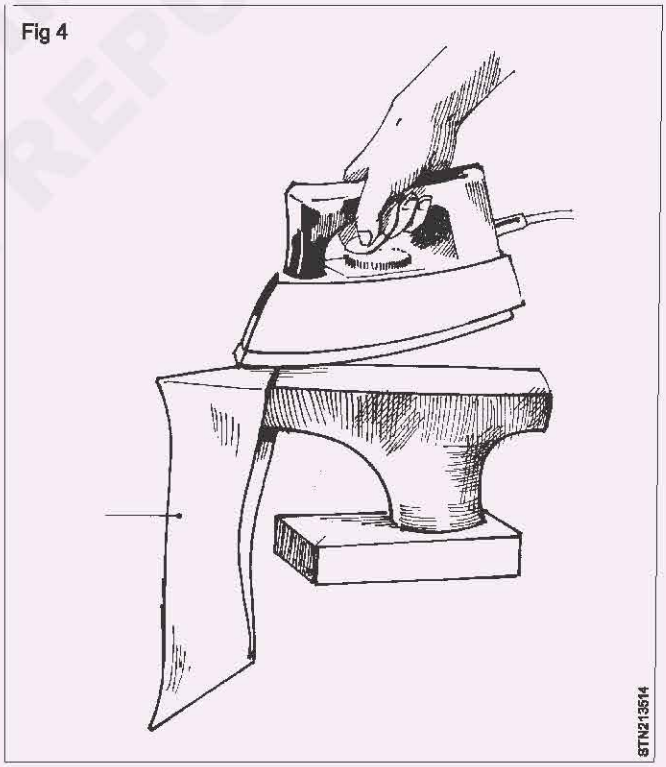

**Tailor's ham:** It is a firmly packed cushion with rounded ends. It is used for pressing shaped areas such as bust darts and curved seams; it is also used for moulding the corner. (Fig 3)

Fig 3




**Point presser:** It is a sharp pointed wooden board and is used for pressing seams in collars and for helping to bring out the sharp points in collars, cuffs etc. (Fig 4)

Fig 4




**Sleeve board:** It is a board with a narrow, long, flat surface on which the seams and details of the narrow sections of the garment, such as the sleeves and the legs of the trouser can be easily pressed. (Fig 5)

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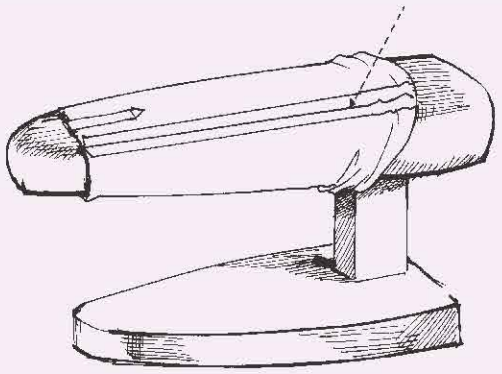
Fig 5



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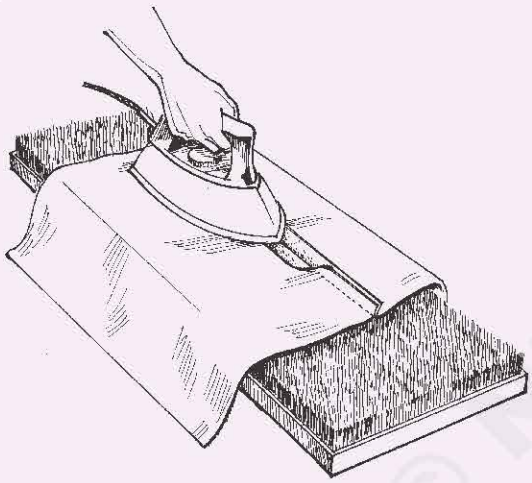
**Needle board:** It is a board with a collection of small needles fixed on a wooden board. It is used to press pile and nap fabric (e.g. corduroy, velvet) (Fig 6)

Fig 6



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**Pressing** is as important process during and after stitching. Pressing will remove wrinkles, sharpen creases, flatten bulky layers and open seams. Pressing can shrink or stretch a fabric.

The main factors involved are heat, pressure and humidity. These factors have to be harmonized with the fabric which shall be pressed.

Pressing is done

- during the construction of a garment (press flat seams, darts, press components in shape etc.)
- for finishing of a garment after stitching.

**Differences between ironing & pressing:** Ironing is the process by which the iron is pushed along the fabric in lengthwise or crosswise direction. The ironing process is used for garments after they have been constructed.

Pressing is the process by which the iron is lifted up and set down on the fabric in a series of up and down motion, in the lengthwise and crosswise direction. Pressing is done for all garments during the process of constructing.

**Safety precautions**

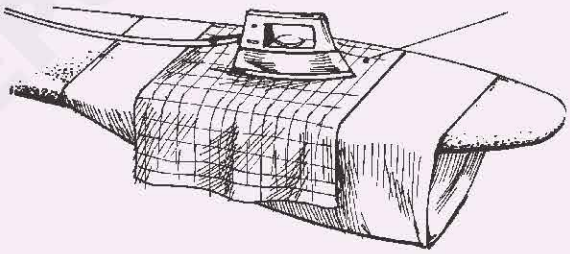
- Do not let iron cord drag over your work.
- Either use the iron stand or tilt the iron when not in use depending on the type of iron you have.
- Do not scorch the ironing board cover.
- If starch is stuck to the iron, let it cool and then scour with soap or non-scratching scouring powder or baking soda.
- Use distilled water for steam irons; empty the same when you have finished your work.
- Make sure that there is no leakage of electricity in any part of the iron, the wire and plug pins.
- Never leave the heating surface of iron on the ironing table or on the cloth when in rest, the iron must be kept in erect position.

Set the regulator or control on your iron correctly for the less heat resistant fibre in your fabric. Temperatures are not always clearly marked on the iron dial but should be graded from hot to cool in this order: linen - cotton - rayon - wool - silk - nylon (and other artificial fibres).

Wet pressing can easily be done with a steam iron. Otherwise sprinkle water directly on the fabric and leave it for a minute before ironing.

Another method of wet pressing can be done with the help of a damp cloth. It is used for linen or wool fabric. For some fabrics like spun rayons, embossed and glazed fabrics its better to press dry. (Fig 7)

Fig 7



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**Techniques for pressing during construction**

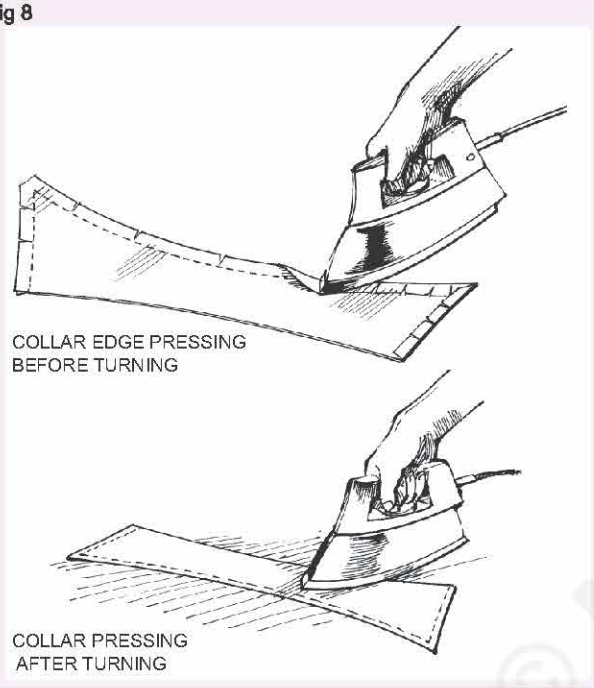
- Pressing over basting is frequently necessary along edges with enclosed seams, pleats or hems. After a first light dry pressing, clip the basting, remove and press again with dampness before the marks made are set on the fabric. Never press over pins.
- Press with the grains, also on bias components press along the grains.
- Have scissors handy at the pressboard to release any pull from points that are not sufficiently slashed. Corners or curves that are to be trimmed or slashed closely are less likely to fray if they are dampened and well pressed before cutting.
- After a piece of garment is pressed, keep it pinned up on a coat hanger or spread out carefully to dry so that you won't have to give it another pressing.
- Gathers are pressed by folding firmly at the stitching line in your left hand. For slow work reduce the heat.

– Hold the side of the iron closely parallel to the stitching line when fullness is to be shrunken out.

– Press-buttons, embroidery, lace, beading, braiding are to be pressed from the wrong side over a soft pad such as layers of turkish towel.

– Press collars, cuffs, belts and pockets first on the wrong side then finish them on the right side very lightly over a press cloth. Press first along the edges firmly, remove basting, press again. Work from the outer edges towards the inside. (Fig 8)

Fig 8




– Do not press lengthwise creases in sleeve if you want a professional appearance, instead use sleeve board.

**Order of pressing work**

– First press interior parts such as pockets, facings, seams, linings and shoulder pads.

– Then press sleeves.

– Press ruffles and gathers before the parts they trim.

– Press yokes and shoulder seams before the lower blouse.

– Press top parts of long garments before the lower parts (blouse before skirt); skirt top before lower part of skirt.

– The collar is usually pressed last, because its position next to the face is so important.

– Finally remove any creases accidentally produced. Do not put creases in sleeve or below dart or undressed pleats.

**Trial room**

As many shoppers have been transitioning to online shopping over the past few years, there have been arguments about how brick-and-mortar shopping will soon cease to exist. However brick and mortar shopping is definitely staying especially for apparel retail stores, where personal service and rooms provide a shopping experience that is not available online. Most shoppers still have similar preferences of being able of personally see. Touch, feel and try on a product before making a purchasing decision online or in-store.

Apparel retailing is the second most prominent segment in organized retail after Food & Beverages. One of the most integral elements in Apparel retail is the touch, feel and trail of product. At a time when online fashion websites are attracting a large chunk of offline consumers, one major motivation which keeps the retail store's footfall is the "trial experience".

Earlier trial rooms used to be a left-over place which was used as a store room but now with retail industry going for a makeover the trial room has also changed their identity from a leftover place to a forefront of the store.

Based on Channelplay's rich exposure in Apparel Mystery Audits, here are some of the best practices which are followed by prominent brands:

**Positioning of the trial room**

Trial rooms should be easily accessible to the consumer at any point of the store. These can be in multiple locations depending on the size of the store however should not be directly visible to a customer.

**Size of the trial room**

The size of the trial room is of utmost importance. At times, the space of the trial room is so congested that the customer feels suffocated in trying out the products and leave the store without even a single purchase.

**Interiors of trial room**

Apparel brands are doing the interiors in an innovative way nowadays. Kid stores, for example have trial rooms with cartoon characters painted on walls so that kids can be kept engaged while they are made to try different clothing items. The look and feel of the trial room varies according to the theme and USP of the brand.

**Seating in trial room**

Seating in the try rooms is a new addition we find in almost all apparel stores now. This gives the customer the convenience to sit down and try different clothing items. There should be enough space for customers to keep their bags etc.

**Lighting**

Lighting is a very important element for a trial room. Some stores have equipped themselves with effective lighting which offers the day and night effect wherein a customer can view himself in a particular dress and how they would look in that dress during the day and at night. This concept of lighting is apt for those stores that sell party wear clothing and accessories.

**Space near trial room**

People generally shop in a group and hence space near a trial room also plays a vital role. While trying different

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clothing items, customers try to seek opinion about the apparel of which they are not sure. If the space near the trial room is not enough for the people accompanying, then the customer might end up leaving the products for which he/she isn't completely sure and hence buying less.

To ensure the hygiene of trial room, retailers must avoid ignoring the important parameters of having a trial room. They must make sure that the value and benefits attached to a trial room is not compromised.

**Three lighting concepts for a perfectly illuminated fitting room**

Depending on your budget and spatial limitations, there are various lighting concepts for ideal fitting room lighting:

**The basic option:** This option consists of a broad-beam LED ceiling spot and two LED profiles mounted on both sides behind the mirror. The spot should be positioned between the mirror and the observer rather than directly above or behind the observer – otherwise the front of the customer will be in shadow.

**The ideal option:** Even better, however, is to use four small LED spots in each corner of the room instead of one single ceiling spot. This way, the customer's silhouette is always optimally illuminated, regardless of how they move or turn. This lighting solution is therefore also suitable for cubicles with folding mirrors.

Fig 8

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## Sketching and drafting of the saree petticoat

**Objectives:** At the end of this lesson you shall be able to
- **introduction to saree petticoat**
- **explain the saree petticoat.**

### Saree petticoat

Saree petticoat is a simple long skirt with an drawstring at waist. Petticoat is a must when wearing a saree as it contributes to its overall drape. Frill is stitched to the hem of petticoat to give a fuller shape at the bottom of saree, as petticoat goes underneath the saree, it's colour should match the saree's base colour, length of the petticoat should be an inch shorter than your saree length. Fabric used for making a petticoat should be light in weight, easy on the skin and durable, cotton, polyester-cotton, satin or silk fabrics can be used to make a petticoat. Type of fabric used to make a petticoat should be selected based on the saree material. Petticoat can be called as an underskirt for saree.

I have shown pattern making of a very basic saree petticoat which has six panels and a waist band to insert drawstring. If you are beginner prefer using pure cotton fabric for making this petticoat. Length of fabric should be 2.5 meters and width can be 36" (for small/medium size) and 44" (for large/ xl size).

### Measurements required: (in inches)

- Low round waist (it is measured from 1 ½" below the naval point).
- Round hips (hips should usually be measured 6 to 8" lower to waist)
- Petticoat length (should be an inch shorter than your saree length)
- Waist band width = 6"

Fig 1

Four Panel Petticoat

Six Panel Petticoat

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# Mass production process

**Objective:** At the end of this lesson you shall be able to
- **explain about mass production process.**

### Introduction to garment technology

"Garment Technology" is the term normally can be defined as the study of technical particulars about the works and processes of Mass Production in Readymade Garment factories. Now a days, Lot of garment industries are emerging in India, and they are manufacturing and exporting different types of Gent's, ladies' and Children's garments to various foreign countries. Also, readymade garments are constructed for domestic market all over in India. A garment technology student should study the entire process and applications of various machineries in garment industries.

### Working behaviour of export houses

Export Houses in India are playing the vital role in Indian economy as well as in Industries. The export houses are getting orders from foreign countries which are in different types of garment styles like Shirt, Ladies House Coat, 'T' shirt, Trousers, Bermudas etc. With the help of the garment manufacturing units, the garments are manufactured and packed and sent for shipment to various countries all over the world.

The export houses get orders from foreign buyers through various types of communications like Internet, contacts, trade exhibitions etc. After the order confirmation, the patterns are prepared in required sizes and according the measurements and specifications. With the help of the Pattern grading, the patterns are grades into various required sizes. The samples are prepared in the required sizes with the required buyer's specifications including the type of fabric and packing and sent for buyer's approval. After the sample confirmation, the purchase department will purchase the required raw materials and accessories for the particular order. The received raw materials are inspected in the stores and the fabrics are sent for cutting section.

The total process can be easily understood with the help of the following flow chart.

### Process flow chart

Orders from Buyers
↓
Pattern Preparation
↓
Pattern Grading
↓
Sample Preparation
↓
Sample Confirmation
↓
Raw Materials Purchase
↓
Fabric & Raw material Inspection
↓
Spreading
↓
Pattern Layout
↓
Marking
↓
Cutting
↓
Numbering
↓
Assortment
↓
Sewing
↓
Trimming
↓
Primary Checking & Alteration
↓
Washing
↓
Mid Inspection
↓
Pressing
↓
Packing
↓
Final Inspection
↓
Shipment.

### Cutting Technology

### Preparation for cutting.

### The Pattern

The pattern set should be checked before cutting whether all the pattern have been properly prepared according to the

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buyer's requirements and instructions. The patterns should be finished with Seam line, cutting line, identification markings, pattern particulars etc.

### Grain Lines

Grain is defined as the direction of yarn in a fabric. Grain line is used to denote the direction in which the fabric should be cut according to its design requirements. Normally the grain line will indicate the warp yarn direction i.e., parallel to the selvedge.

### Pile Direction

In case of pile fabrics like corduroy and velvet, all the pattern pieces should be laid in the same direction. It is important that before layout, the pile direction is properly checked and according to that the pattern layout should be planned. Also, while spreading process, the each and every ply should be cut and laid in the same direction.

### Fabric Pattern

Like pile fabrics, the fabric design pattern should be considered before layout and cutting. If the fabric has one way design, then we have to follow the layout and cutting like pile fabrics. And in the case of striped and checked design fabrics, the design line should be well planned before cutting.

### Cutting

After the patterns are laid on the fabric lay, the outlines of the patterns are marked using marking chalk. Then the fabric lay is cut along the pattern mark using cutting machines. Cutting machines are generally used for cutting various parts of garments, lining fabrics, fusing fabrics, etc., Cutting machines are available in different forms, shapes and sizes with varying capacity and purpose.

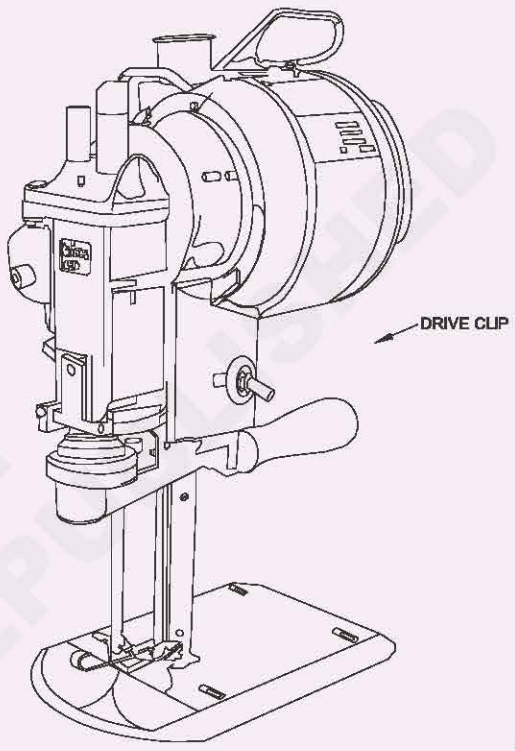
Types of cutting machines

1. Straight knife cutting machine
2. Round knife or Roller knife cutting machine
3. Band knife cutting machine
4. Die cutter

### 1 Straight knife cutting machine

The straight knife cutting machine consists of a base plate, an upright stand to hold the vertical blade, motor, a handle for moving assembly, a sharpening device and a handle to transfer the whole assembly from one place to another. Two kinds of power is required to operated a straight knife. Motor power drives the reciprocating blade and operator power drives the knife through the lay. Normally the available blade heights vary from 2.5 to 4.5 cm. The greater the blade movement the faster the blade cuts the fabric and more easily the operator can move the machine. The most important consideration is selecting a straight knife is the power required from the operator to move the knife through the lay, operator effort is affected by the weight of the motor, the shape of the stand, handle height, stroke, sharpness of blade and the base plate movement. The normal blade has a straight edge that varies from coarse to fine depending upon the type of the fabric being cut. Wavy eager knifes are used to reduce the heat generation and hence can be used for cutting synthetic materials without fusing difficulties. The speed of the blades can also be adjusted by having variable speed mechanism. The straight knife is a common means of cutting lays in conventional cutting rooms because it is versatile, portable, chapter than a band knife and easy to maintain. Even if a band knife is used for main cutting operation, a straight knife will be used to separate the lay into sections for easier handling. (Fig 1)

Fig 1




STRAIGHT KNIFE CUTTING MACHINE

### 2 Round knife or Roller knife cutting machine

A band knife comprises a series of three or more pulleys powered by an electric motor, with a continuously rotating steel blade mounted on then, one edge of the blade is sharpened. The principle of operation is different from a straight knife, in that the band knife passes through a slot in the cutting table, in a fixed position and the section of lay to be cut is moved past it. The blade is usually narrower than on a straight knife. (Fig 2)

Band knives are used when a higher standard of cutting accuracy is required than can be obtained with a straight knife. Space must be left around garment parts when marking so that they can be cut from the lay using a straight knife and then cut exactly using the band knife. When small parts such as collars, cuffs and pockets are cut, a template of metal or fibre board in the shape of the pattern piece may be clamped to the section of lay on top of the marking which is then drawn past the band knife blade, cutting exactly along the hard edge. Bard knife cutting machines are used more in mens wear than in women's wear and are often used to cut large garment parts such as the large panels of jackets and over coats.

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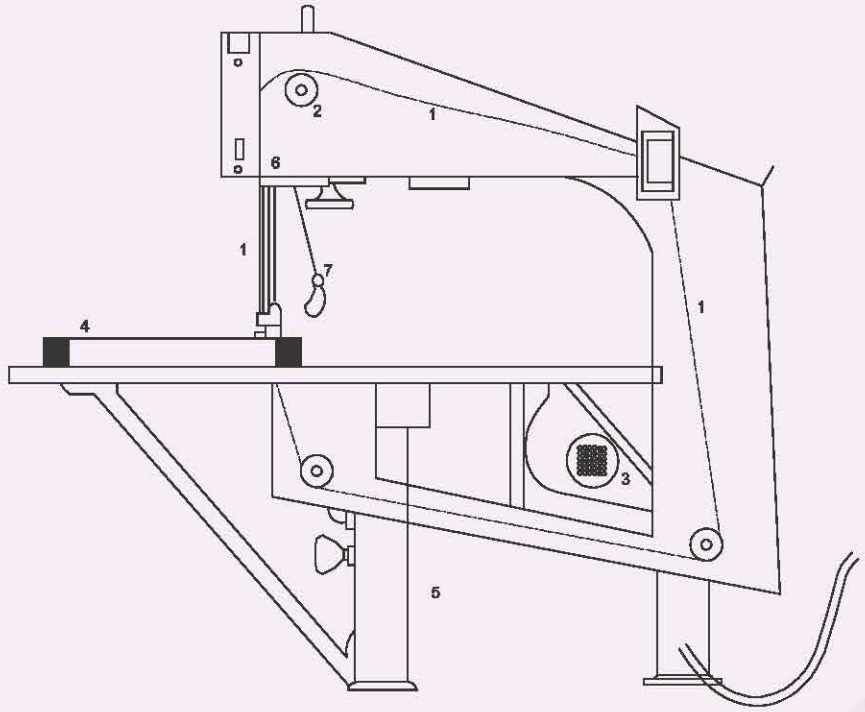
Fig 2




**Difference between Straight knife and Band knife cutting machines.**

| Straight knife cutting machine | Band knife cutting machine |
|---|---|
| 1 It has straight blade. | 1 It has endless blade. |
| 2 Here the fabric lay is stable and machine is movable. | 2 Here the machine is stable and fabric lay is moveable. |
| 3 Less accuracy compared to band knife. | 3 More accuracy compared to straight knife. |
| 4 It is portable. | 4 It is big size not easily transferable. |
| 5 It is not having cutting tabled. It has base plate only. | 5 It has a wide cutting table. |
| 6 It is safer and there is no need of safety tools like gloves. | 6 The machine needs safety measures like Iron gloves. |

### 3 Round knife cutting machine

The elements of a round knife cutting machine are a base plate, above which is mounted an electric motor, a handle for the cutter to direct the blade, and a circular blade rotating so that the leading edge cuts downwards into the fabric. Blade diameters vary from 6 cm to 20 cm. Round knives are not suitable for cutting curved lines in high lays because the blade does not strike all the plies simultaneously at the same point as a vertical blade does. Therefore a round knife is used only for straight lines or lower lays of relatively few plies. It is naturally much more difficult for a circular blade to cut a tight curve, such as an armhole.

### 4 Die cutters

Die cutting machines are having most accuracy than the other cutting machines like straight knife, band knife and round knife cutting machines. It is rarely used in the garment industries. The 'Die' is a knife made of iron in the shape of pattern pieces like collars and cuffs. In a die cutting machine a small cutting table has been provided and above the table the dies are fixed with the help of iron bars. After laying the fabric on the cutting table, with the help of a switch we can activate the 'Die' for cutting. The die is moving fast from it's top position, presses the fabric lay and cuts the lay as per their shape. Hydraulic pressure is normally used to move the die.

**Advantages:** It has the most accuracy than any other cutting machines.

**Disadvantages:**

1 The cost if the machine is very high.

2 It consumes more fabric and makes more fabric waste.

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3 The dies are loosening its sharpness quickly and replaced with a new one. And also, the preparation cost or production cost of a die is very high.

Due to the above disadvantages the die cutters are not mostly used in garment Industries. In some Industries, it is being used for cutting non-woven interfacing for collars, collar bands and cuffs.

Fig 3

Fig 4

## Fusing Technology

### Fusing

Fusing is process of fixing the interfacing fabric (Commercially known as 'Canvas Fabric') with the facing fabric with the help of heat treatment. For that the used 'Fusible interfacing' has a gummy coating at one side which is applied to fuse and fix with the fabric. The machine which is used for fusing process is known as 'Fusing Machine'.

### Fusing Machine

1 This machine is used to attach the fusible interfacing of Collar, Cuff with their respective fabrics by Fusing (Heating) action.

2 After the fabric with interfacing are placed on a part like tray, it is moved into a place where the fusing action is being done by heat pressing action.

3 We can adjust the temperature & Pressure according our requirements.

4 There are different fusing machine types are steam press, flat bed press, continuous fusing press etc.

5 These machines are suitable for both woven and knitted garments.

There are different types of fusing machines are used in garment industries. Following are the three important types.

1 Steam Press Fusing Machine

2 Flat Bed Fusing Machine

3 Continuous Fusing Machine

#### 1 Steam press fusing machine

It is the old model of fusing machine. Here steam and pressure is used for fusing process like steam irons. It is difficult to adjust the steam temperature, pressure and timings according to the types of resin. Hence, it is a failure model in the Industries.

#### 2 Flat bed fusing machine

It is a common type of fusing machine which is used in maximum no. of industries. These machines are available in a wide variety of types from small table models to large, floor standing machines. The loading will be in the machine either by mechanical or by manual. The heat is produced by a heating element electrically and we can control the temperature, pressure and time according to the fabric types. There are two types of models available in the market according to the action of the pressure source. They are,

a Vertical action model

Fig 5

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b Scissor action model

Fig 6

The fusing operation can be done in batch wise according to the no. of pieces. Ex. 50 pieces in one time.

### 3 Continuous fusing machine

This is a famous model fusing machines and now days popular in factories. Here the heating elements which are in modules (groups) have been fixed in the center portion of the machine. After that, pressure roller arrangement is there which will apply proper pressure on the fused pieces. Also a conveyor belt arrangement is there, which is feeding and delivering the pieces continuously from one end and to the other end. The pieces are fed at the one end continuously, the pieces are entered in to the heating modules for heating and then passed between the pressure rollers for pressure and finally delivered at the other end of the machine. This machine is used to achieve the maximum production.

Fig 7

### Fusing parameters

The following factors which are affecting the quality of fusing is called as Fusing Parameters. They are,

### 1 Time

The time of heating and pressure should be set properly according to the types and nature of the interfacing or interlining fabrics as well as the base fabric. Resin type should also be considered for that.

### 2 Temperature

Setting proper temperature is important in fusing depending upon the resin and fabric types. If less temperature is applied, then the fabric will not be fused properly and more temperature creates damages if melting of the base fabric and interlining/facing.

### 3 Pressure

Effective pressure should be applied to the fabrics after fusing for setting the fabric with interfacing/lining. This process can also be defined as "Heat Setting". Less Pressure will give wrong results of heat setting.

### Industrial machines

### Different types of Machine stitches

The important types of machine stitches are,

1 Lock Stitch

2 Chain Stitch

3 Over lock Stitch

4 Flat lock Stitch or Inter lock Stitch.

### 1 Lock stitch.

1 It is the commonest were stitch type which locks flat and neat.

2 It does not ravel.

3 Similar appearance at top and bottom.

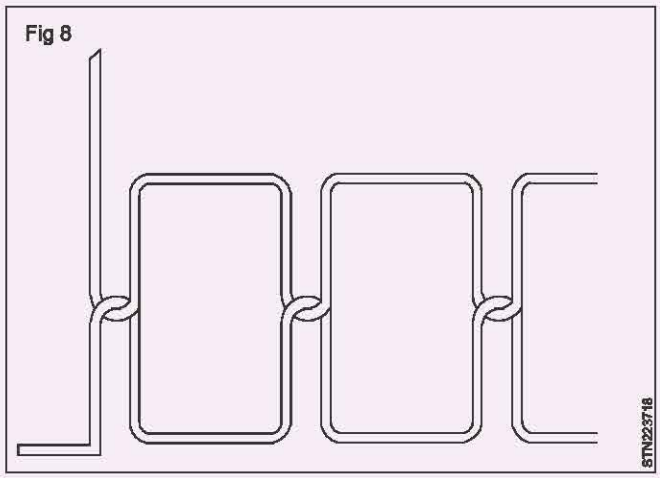
4 Very limited insensibility.

5 Can be started and finished at any point on the fabric surface.

6 Its mainly used for women garments and for very limited ape rations in the knitted garments.

7 It has two threads one is needle thread other is bobbin thread forming the stitch by inter lacing.

Fig 8




### 2 Chain stitch

1 Here there are two types of thread are using one is needle thread and the other one is looped thread.

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2 In this type of chain stitches are formed by inter looping on intra looping or inter looping with inter lacing. The single thread chain stitch formed by intra looping and double thread chain stitch formed by both inter looping and inter facing.

3 Very high extensibility (elastically or stretch ability) if sufficient thread introduced.

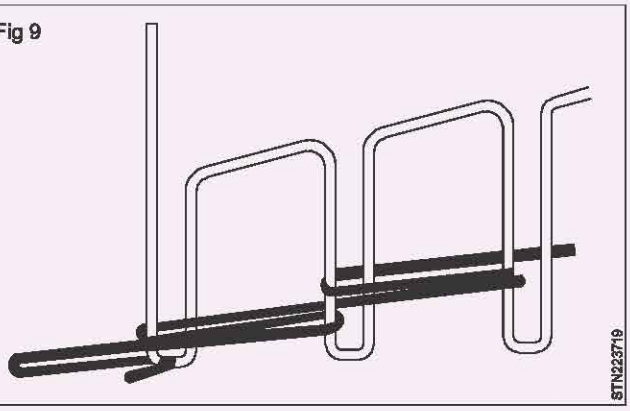
4 Next and cannot be unravelled easily (some type of interloping or intra looping chain stitches can be easily unravelled)

5 Very good strength.

6 Tends to eliminate or reduce puckering problems.

7 These type of stitches are mainly used for knitted fabrics.

Fig 9




**Difference between lock stitch and chain stitch**

| Lock stitch machine | Chain stitch machine |
|---|---|
| Similar stitch is formed on both sides of the fabric. | Chain stitch is formed on the lower side of the fabric. |
| Thread consumption between needle and bobbin is 1:1 bobbin thread to the bobbin should be refilled frequently. | Thread consumption between needle and looper is 1:3 looper thread comes directly from thread stand. |
| They have bobbin, bobbin cases and hook set. | They have loopers and spreads. |
| Used for non-stretchable portions like color, cuff, pocket, etc., | Used for stretchable portions like a seam, shoulder attachment, etc. |
| Stretch ability 0.4% | Stretch ability 1.6% |

### 3 Over lock stitch

1 The over lock stitches are fabric edge finishing stitches used as seam finishes.

2 Here two types of threads and used one is needle thread and other is looper threads.

3 There are two types of over lock stitches one is three thread over lock stitch and other is five thread over lock stitch three thread over lock one needle thread two looper threads are used. But is fine thread over lock two needle thread to looper threads and one guide thread are used. In fine threads are forming the double locked chain stitch near the three threads over lock stitch. By this the two operation attaching finishing is reduced is one process.

4 There stitches are formed by inter looping and inter lacing.

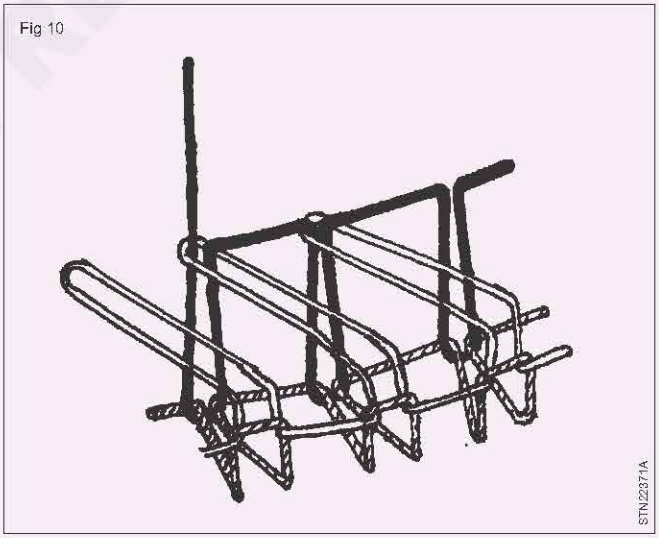
5 Good strength and very high extensibility when suitably adjusted.

6 The upper and lower threads inter loop to build the trimmed edge of the fabric.

7 This type of stitch is suitable for armhole finish, side closing, Crutch seaming, inside leg finishing etc., on both women and knitted garments.

8 In this machine a trimmer is used for cutting the edges with neat. (Fig 10)

Fig 10




### 4 Flat lock stitch or Inter lock stitch

1 The flat lock stitch or inter lock stitch is mainly used for hem finishing in knitted garments.

2 Here the needle threads, looper threads and guide threads are forming the stitch by inter looping and inter facing.

3 There are different types of flat lock stitches with different versions wing thread or fine thread.

4 Flat and comfortable.

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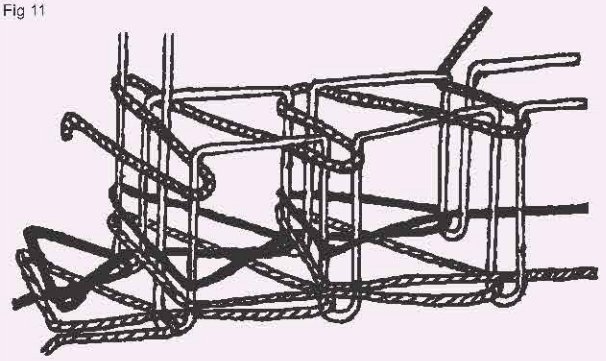
5 Secures cut and folded back raw edge neatly and securely top and bottom corner.

6 Will not unravel easily.

7 Very good insensibility. (Fig 11)

Fig 11



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**Different types of Industrial Sewing machines**

The following is the wide classification of industrial sewing machines.

1 Lock stitch machine
- Single needle machine
- Double needle machine.

2 Machines having lock stitch variation
- Zigzag machine
- Bar tack machine
- Button hole making machine (Now a days Chain stitch based button hole machines are also used)
- Designed lock stitch machine
- Eyelet machine

3 Machines based on chain stitch
- Chain stitch machines (single needle and double needle machines)
- Over lock machine (3thread, 4thread, 5 thread)
- Flat lock or inter lock machine (4 and 5 thread)
- Feed of arm machine
- Button fixing machine (Now a days lock stitch based button fixing machines are also used)
- Blind stitching machine

4 Embroidery machine.

**Common properties of all type of Important machine**

1 These machines are having high power motor with foot control to drive the machines. In some machines motor control facility is used to increase or decrease the motor speed with speed indicator.

2 These machines are having automatic thread control facility which will trim the upper and the lower thread after reversing pressing the petal of the foot control.

3 These types of machines having computerized stitch control facility with different patterns. With the help of this we can change the stitch patterns and stitch density according to the fabric type and style.

4 These machines are having automatic or flow system all over the machine parts. As oil tank is provided at the bottom portion of the machine and we have to fill the tank with the required around of machine oil with the minutes tubes the oil is cycled all over the machine parts while in working connection. The extra oil again reaches the oil tank. With the help of oil indicator we know the colour and level of the oil normally when the oil changes to dark brown colour is replaced and new oil filled inside the tank. (This point is suitable for lock stitch and lock stitch variation machines only)

5 These machines are having back stitching facility when starting stitches at the fabric end. In some machines the automatic back stitch facility is fixed with sensors.

Fig 12

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**Lock stitch machines**

1 This is the commonest type of machine normally used in women garment industries. It is also used in knitted sector for along some operations.

2 There are two types of machines (1) Single needle (2) Double needle.

Fig 13

**Double needle lock stitch machines**

1 Double needle machines are used for top stitching

2 It is normally used in top stitching for shirt yoke, collar, pocket, etc.

3 It has a speed of 4000 stitches per minute with electronic controls.

4 Having automatic positioning at the needle in an up or down position.

5 It is used for almost all the operation.

**Button hole making machine**

1 This machine is used to create button hole with different sizes for all fabric types.

2 We can change the length of the buttonhole stitch density and buttonhole length.

3 Here first stitches are produced and a blade is used to make a slit at the centre portion of the button hole stitches. The material is cut automatically either before or after the sewing process.

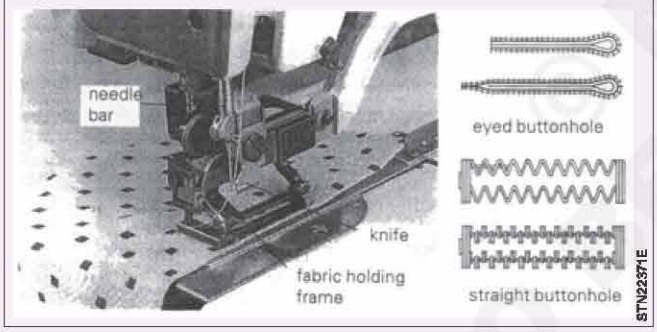
4 Normally to size of blades are used in garment industries are ½" & ¾".

5 A long scale fixed in these machines used to follow the distance between two button holes.

6 In advanced types of buttonhole machine we can do the buttonhole construction by adopting various stitch patterns controlled by micro processor. By this machine we can also produce key holes type of button holes.

7 Now a days, both lock and chain stitches are used in buttonhole machines.

Fig 14




8 Straight buttonholes are used mainly for shirts and blouses; eyed buttonholes are for outerwear such as jackets, coats and trousers.

**Button sewing machine**

1 Button fixing machines are used to sew the button automatically on into garment.

2 This machine is used to stitch for button with two holes or four holes by simple adjustment to the button clamp and the spacing mechanism.

Fig 15

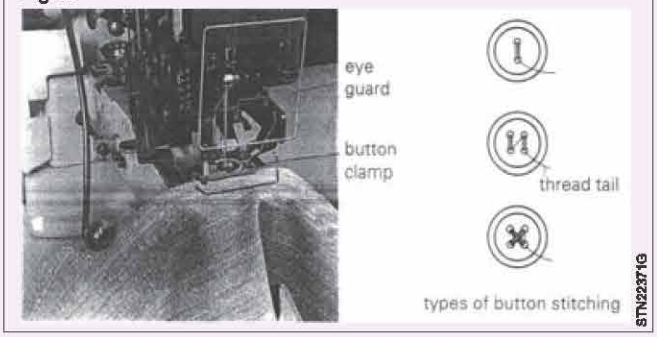
3 There are two types of button stitching machines are there one is lock stitch produced by two thread and other one as chain stitch used with a single thread normally maximum industries are using the chain type button sewing thread normally maximum industries are using the chain type button sewing machine. But using lock stitch the buttons are fixed stronger than the chain stitch. Buttons sewn with chain stitch can be unstitched easily if the last stitch is not fastened properly.

4 The normal speed of the machine is 2700 stitches per minute.

5 We can make the stitches on the button either across over or parallel type the no off stitches depending up on the type of machines used. Each machine has a maximum number of stitches in 16, 24, or 32 with stitch adjusting facility.

6 Anybody can easily operate this machine but we have take care for correct fixation of the buttons at the clamp otherwise either the needle or the button will break. The buttons may be introduced by a special button magazine also. The needle bar is made to oscillate between the two holes being sewn. If there are four holes, then the button clamp is also moved. At the appropriate moment, to bring the second pair of holes into work.

Fig 16



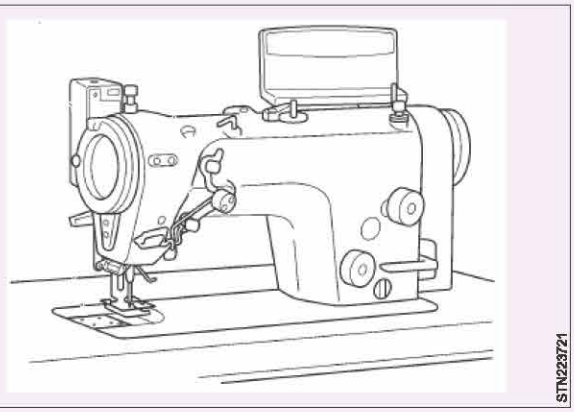

## Zig-Zag machine

**Objective:** At the end of this lesson you shall be able to
- **explain about zig-zag machine.**

The Zig Zag sewing machine is a motorized sewing machine which requires some experience in handling to control the speed of sewing. Apart from ordinary sewing machines, these machines have some additional parts and functions. This is used to perform zig zag stitches in various patterns for functional (e.g. buttonhole stitching)

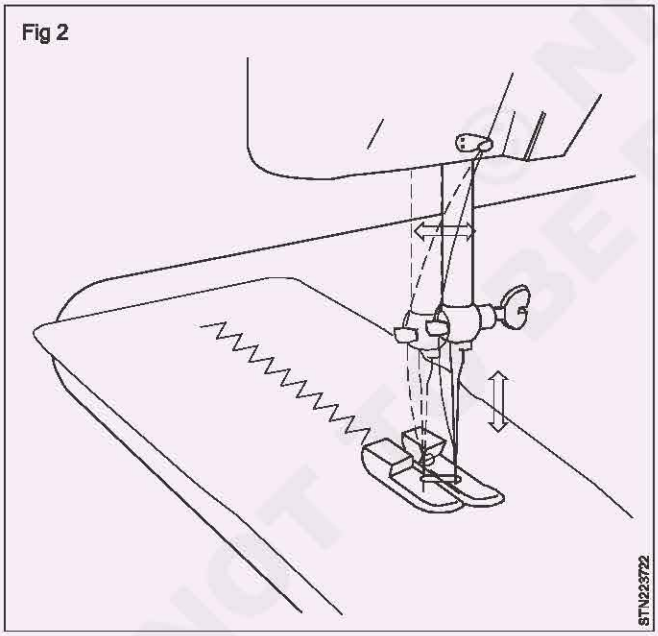
and decorative purpose. (Fig 1). The appearance of the zig zag stitch as a decorative stitch is very close to the satin stitch.

Fig 1




It is a multipurpose machine which has a all purpose presser foot and needle plate with wider needle opening for zig zag stitching. This is the variation of lock stitch machine. This stitch type produced by this machine is a variation of lock stitch produced in a zigzag manner by the needle movement and feed mechanism. This machine having stitch density control to produce different stitch appearance. While performing the stitch, the needle not only moves up and down but sews also from left to right. The shuttle race moves correspondingly to help forming the stitches while the fabric moves forward at the same time. (Fig 2).

Fig 2




Width and length (distance between the single stitches) of zig zag stitch can be manipulated in order to create different designs. (Fig 3).

The stitch length is controlled with the help of the stitch regulator. (Fig.4). It has stitch length dial (1), index mark (2) and the left lever (3) which all are used to modify the stitch length.

The width of the zig zag stitch can be modified with the help of the electronic operation paenl. (Fig.5).

Fig 3

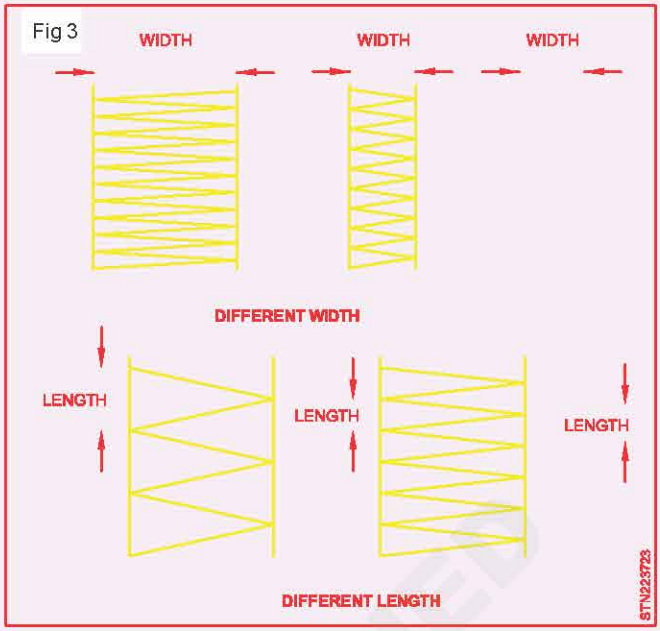
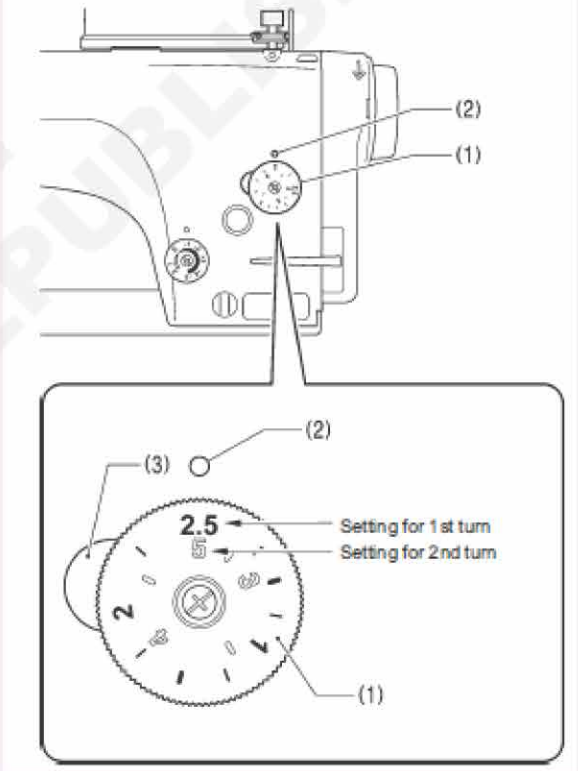



Fig 4




These machines are having high power motor with foot control to drive the machines. In some machines motor control facility is used to increase or decrease the motor speed with speed indicator. These machines are having automatic thread control facility which will trim the upper and the lower thread after reversing pressing the petal of the foot control. These types of machines having computerized stitch control facility with different patterns. With the help of this we can change the stitch patterns and stitch density according to the fabric type and style. These machines are having automatic or flow system all over the machine parts. As oil tank is provided at the bottom portion of the machine and we have to fill the tank with the required around of machine oil with the minutes tubes the oil is cycled all over

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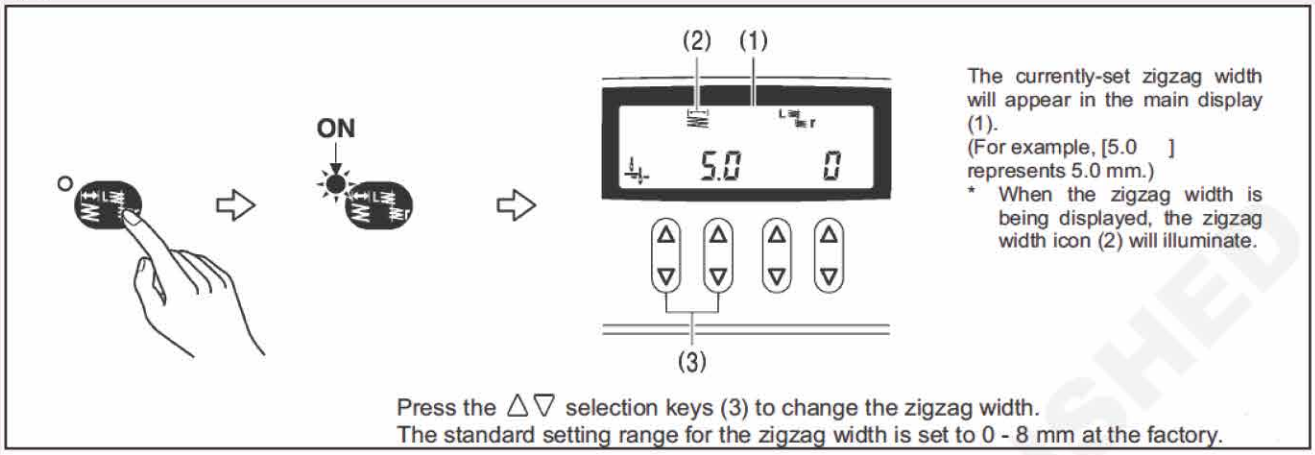
the machine parts while in working connection. The extra oil again reaches the oil tank. With the help of oil indicator we know the colour and level of the oil normally when the oil changes to dark brown colour is replaced and new oil filled inside the tank. These machines are having back stitching facility when starting stitches at the fabric end. In some machines the automatic back stitch facility is fixed with sensors. This machine is mainly used for producing decorative stitches in hand kerchiefs and other hems also we can used this for the purpose of doing embroidery work. With the help of machine we can also produce straight lock stitch.

Fig 5


(2) (1)
ON
5.0 0
(3)
The currently-set zigzag width will appear in the main display (1).
(For example, [5.0 ] represents 5.0 mm.)
* When the zigzag width is being displayed, the zigzag width icon (2) will illuminate.
Press the △▽ selection keys (3) to change the zigzag width.
The standard setting range for the zigzag width is set to 0 - 8 mm at the factory.
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## Mass production process - Sewing & Finishing

**Objective:** At the end of this lesson you shall be able to
- **explain about sewing & finishing in mass production process.**

### Bar tacking machine

1 This is the variation of lock stitch machine which few a number of stitches across the point to be reinforced and then sew cornering stitches over and right angles to the first stitches

2 The machine having the facility of making stitches from 18 to 42 stitches and we can change the stitch density according to the requirement.

3 The machine has a normal speed of 3200 stitches per minute.

4 In some machines a mechanism which signals audibly and usually when the bobbin thread is below a certain level.

5 This machine is mainly used at the edges of pockets, flaps, Belt carriers etc.

6 Some special type of bar tack machines are used for sewing small decorative tucks and shapes. (Fig 1)

Fig 1

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**Feed off arm machine**

1 The machine name suggests the shape of the machine which is having a bend towards the feed mechanism.

2 It is a double needle machine used to form chain stitches for this the needles are fixed diagonally and provided with the device for lubricating the thread.

3 It is having lapped seam folders used to produce lapped seam or flat fell seam.

4 The maximum speed ranges from 4500 to 5500 SPM (Stitches per Minute).

5 This is used for side closing in women garments and producing covering stitches in knitted garments covering stitches in heavy fabric are especially made by this machine.

6 The advanced machines are available with three needles with thread trimming and sucking device. (Fig 2)

Fig 2

**Snaps fixing machine**

1 This machine is used to fix the snaps (press buttons) easily in the garment.

2 It fixes the four parts a cap & socket for outer portion and a knob & post for inner portion.

3 It is used to fix the snaps easily by the pressing action actuated by air pressure.

4 This machine is used to fix different type and sizes of snaps.

5 This is used to fix snaps for both women and knitted garments. (Fig 3)

Fig 3

**Collar turning machine** (Fig 4)

1 This is used to turn the Collars in mass production.

2 Here, two moving parts are acting and the collar is placed on one part and with the help of the other part the collar has been turned successfully.

3 It is used to maintain the sharp collar points.

4 There are different types of machines like manual, semi automatic and automatic machines.

5 It is saving the time by avoiding the process of putting thread inside the collar to get sharp point.

Fig 4

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**Embroidery machines (Fig 5)**

Fig 5

1 This machine is used to create different types of embroidery patterns both on woven and knitted garments.

2 There are different types of embroidery machines used in the garment industries according to the requirements. There are electronic controlled embroidery machines, Micro processor controlled embroidery machines, and computer embroidery machines are available.

3 In advanced computer embroidery machines, we can create different type of embroidery stitches with different patterns with best quality and accuracy. There are also giving high production in minimum time.

4 In advanced machines there are maximum twelve heads and a long embroidery frame is used with 10 needles per each head. With this, we can produce the embroidery pattern per head , the size of 75 Cms. Length and 50 Cms. Width.

5 A computerized embroidery machine can store up to 2,59,000 stitches and produce any type of embroidery pattern.

6 Now embroidery machines are also used for making cording stitches, Couching, Sequence work etc.

7 The maximum cost of computerized machine will be 50 lakhs to 2 crores depending upon the specifications.

8 Mainly three types of stitches are used in computerized embroidery machines are Running Sttich, Satin Stitch and Filling Stitch.

9 These machines having the different frame sizes i.e., 9", 12", 15", 18" & 25".

10 The notable computerized embroidery machine brands are BROTHER, TAJIMA, NELCO, HAPPY 2SK etc.

**Types of sewing production systems**

There are 3 types of production systems are being followed in Garment Industries. They are,

1 **Group System or Assembly System**

2 **Band System or Conveyor System**

3 **Individual Production System or Piece rate System**

**1 Group System**

In this type of system, the sewing machines are arranged in Group wise and each group will do one operation of a garment. For example, if one group is doing Back with Yoke attaching of a Shirt then the next group will do front placket for a Shirt. And one group will do the assembling operations like collar attaching, sleeve attaching etc.

**Merits :**

- We can get very good quality
- Semi skilled operators can also be utilized.

**Demerits :**

- We can't see the finished garment on the same day. Last day only we can get all the garments bulkily.
- This will create quality problems.

**2 Band System**

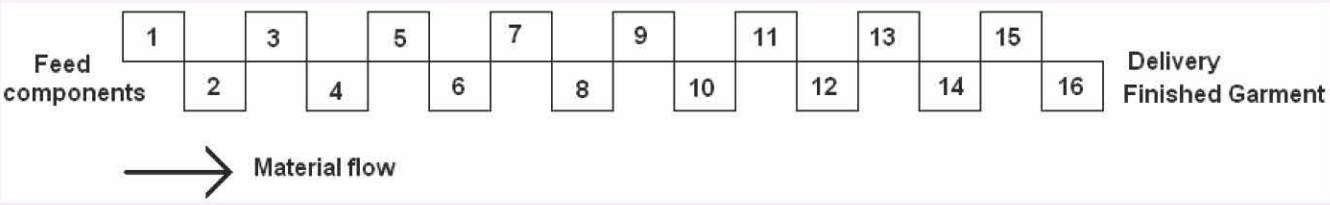
This system is widely followed in garments industries. The machines are arranged one after the other as shown in the figure and formed like a band. The First operator will do the first operation of the garment while at the end of the band, the garment is completely finished.

**Merits**

- We can see the garment in full finished form within a short period. Hence we can easily do the quality control.
- No accumulation of the materials.

**Demerits**

- If one person or machine has problem then the entire band will be affected.
- Skilled operators only be needed and semi skilled operators affect the flow of material.



### 3 Individual Finishing System

Here only one person completely sews the garment. In this system, normally wages are fixed according to the no. of garments stitched per day. Hence, It is called as "Piece Rate System". The only merit of this system is we can get more production. But the demerits are, Poor Quality, requirement of skilled labours, chance of raising disputes among workers etc. (Fig 6)

Fig 6

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### Garment finishing

The garment finishing mainly has the processes of Trimming (Thread cutting), Laundering, Stain removing and Packing.

### Trimming

In this process, First the large hanging threads and small protruding threads are removed my manually with the help of a Thread clippers. They are used to cut the larger and small threads manually.

Thread Sucking Machine is extensively used to remove dust particles and all loose thread from finished garments and textile products. These are scientifically designed to remove all loose thread and dust particles from finished garments, through a specially designed suction operation simultaneously creating an oscillation, similar to dusting of garments. They are suitable for all kinds of light and heavy garments, home furnishing items and even heavy bath rugs. They have easily removable lint filter provided for collection of all lint, loose thread and dust particles. The machine can handle more than 2000 pieces in an average 8 hour shift. (Fig 7)

### Laundering

In mass production, some buyers need washed garments. For that, the garments are manufactured with shrinkage allowances and then washed, pressed and packed. For washing, and drying works, Washing and Drying machines are used in the washing section. The whole process is known as "Laundry" in commercial term and the following equipments are used for laundry.

1 Washing Machines

2 Hydro extractors

3 Drying Machines

Fig 7

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### 1 Washing machines

Washing machines are used to wash the garments in mass production. Two types of washers are available,

i Agitator Type

ii Cylinder Type

The washing machine contains "wash tubs" are made of anodized aluminum or porcelain enameled stainless steel from inside and synthetic enamel on the outside. Conventional washers have round tubs, though square tubs with rounded corners are also frequently used. Few models have double walled tubs for preventing rapid cooling of wash water. Below the agitator is a "Sediment trap" which prevents settled dirt from circulating back into the clothes. Lid of tub is usually separate though it may also be attached to a side to tub. At the bottom of tub is usually attached an opening for drainage of wash water, when required, to be used either directly or through a "drain Plump".

The latest type washing machines are having timer and speed control, to keep the agitator in motion for a desired period or to regulate the agitation frequency. A water extractor is provided for extraction of wash water from the garments. This is a perforated metal drum, enclosed in a "drain tub" and is rotated at a speed between 300 and 1100 revolutions per minute. Excess water is centrifuged out and then drained out by the drain pump. This is provided on the side of main washer, as a single unit or may be separate.

"Wringers" are also provided which are actually two rubber rollers provided at the top of the machine. Clothes or garments are passed under pressure through the two

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rollers, which while rotating extract to leave a maximum of 32% of the water retained in the clothes. (Fig 8)

Fig 8

## 2 Hydro Extractors

The Hydro extractors are used to remove the water from the fabrics or garments after washing. These are used to remove the water by centrifugal force instead of squeezing the garments. After hydro extraction, then the garments are taken to drying machines. (Fig 9)

Fig 9

## 3 Drying Machines

Drying Machines which are simply called "Driers" are used to dry the garments quickly in the garment Industries. It is also looks like washing machine, but which is having a cabin for putting garments and hot air has been passed through the cabin which quickly dries the garments. The temperature and time of hot air passage can be set according to the requirements. Now a days time and automatic temperature control are also provided in the latest models. A small drying unit is also provided in the latest domestic model washing machines. But in Industrial models, due to the large quantities, separate big type driers are used for drying the garments. (Fig 10)

**Packing**: Packing is the process of presenting the garments to the buyer in a well secure and safety state. The garments are pressed and packed individually and after that the individually packed pieces are bulkily packed in cartons or containers.

Fig 10

### Types of individual piece packing

The main types of Individual piece packing or folding the piece are,

1 Hanger Pack

2 Dead Man pack

3 Flat Pack

4 Stand up pack.

### 1 Hanger Pack

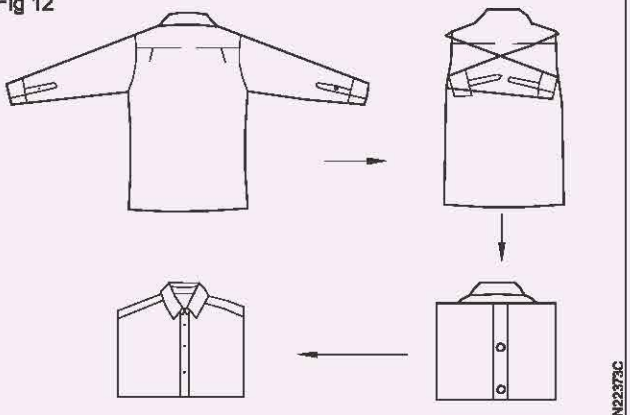
In hanger pack, the garment is pressed and packed with hanger in a ploy bag without folding. (Fig 11)

Fig 11

### 2 Dead Man Pack

This type of pack is suitable for Shirt only. Here, the Sleeves of the garment are folded and joined in the front or back portion like a dead man and the entire garment is folded in lengthwise centre direction. (Fig 12)

Fig 12




### 3 Flat Pack

In this type of folding, the garment is packed as per the given folding size with supporting materials like, Back support, Tissue Paper, etc. But the Collar portion should not have any supports like, Butterfly, Band etc. (Fig 13)

Fig 13

### 4. Stand-up Pack

This is similar to Flat back but, the Collar portion should be in Stand condition with the help of the supports like, Butterfly, Band etc. It is suitable for garments which are having the collar part. (Fig 14)

### Packing materials

For doing different types of packing, things like back support, tissue paper, pins etc. are used. These are called as "Packing Materials". These are used for several purposes and used to improve the quality of the packing. The different types of packing materials and their usage in packing have been given in the following paragraphs.

Fig 14

### a Poly Bags:

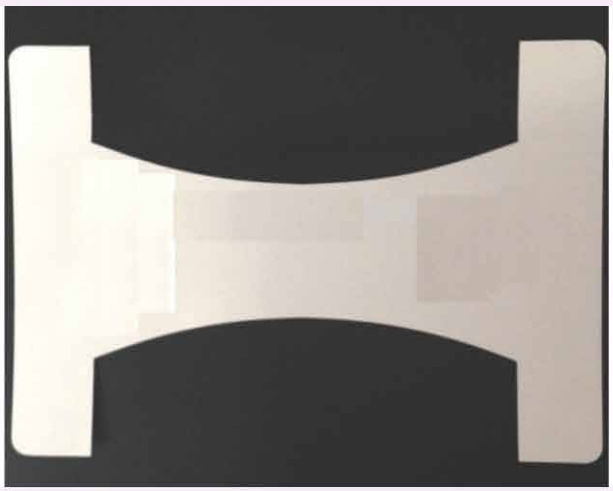
Poly bag is the important packing material used in all types of packing. It is the bag made of poly ethylene products used to protect the garment from dirt, water, dust and other foreign matters. The size of poly bag is determined by the types of packing and folding size. (Fig 15)

Fig 15

### b Back Support Board

It is the important packing material used in Stand up and Flat pack used to achieve correct folding size. It is made of thick Card board and having the dimensions according to the folding size. It should applied the back portion of the garment and it is used to make easy for pressmen to achieve the required correct folding size. Also the back supports are giving strength and compact to the packed garments. (Fig 16)

Fig 16



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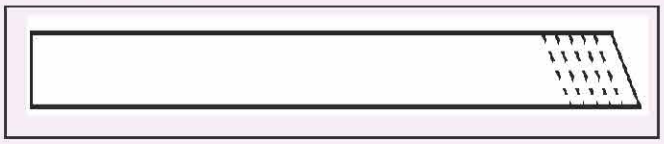
### c Inner Collar Band

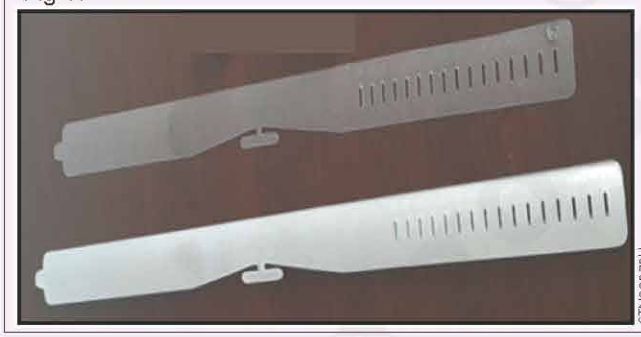
It is used in the inner collar portions of the garments like Shirt. It is made of card board and used in between the collar and collar band.



### d PVC collar Outer Band

It is very important packing material used in Stand up Pack particularly for Shirts. It is made of Poly Vinyl chloride and used in collar portions. This is used to give support to the Collar band in the outside area. (Fig 17)

Fig 17



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### e Butterfly

This is also used in standup pack of Shirts. It is made of PVC and used in neck portion at the collar pic area below the collar points. This is used to give a raised and beautiful appearance to the collar points. (Fig 18)

### f Plastic Clips

This is made of thick plastic. It is used to hold the folded edges, used to join the sleeves in the centre portion. It is used in all types of packing for holding and joining the edges to protect the fold of the packing. (Fig 19)

### g Pins

Pins are used to hold the edges of the folding and also used to join the two parts. It is used like clips to protect the folding of the packing in all types of packing. It is made of metal. (Fig 20)

Fig 18

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Fig 19

STN22373J

Fig 20

STN22373K

### h Hand Tags

The tags are applied to the pack after pressing and packing of the garment. In tags, the details of price, fabric, brand name etc., are printed and made hung with the pieces. According to the details printed on that, the tags are classified as Fabric tags, Price Tags, Brand Tags, Bar code tags etc. (Fig 21)

Fig 21

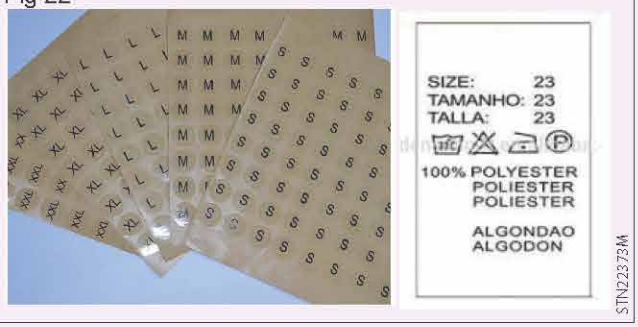
STN22373L

### i Tissue Paper

Tissue paper is the thin and white paper which applied inside particularly Steam pressed cotton garments. The

tissue paper absorbs the excess moisture of the cotton garments and protects them from fungal problems. Also it is used to give slight strength and flexibility to the synthetic garments. (Fig 22)

Fig 22




### j Stickers

The stickers which made of polyethylene are stuck out side of the poly bags for displaying the printed information like size and usage of garment. The two important stickers types are, 1. Size Sticker - which has the garment size and 2. Warning Stickers - Having information regarding safety and protection of the garment. (Fig 23)

### k Cartons

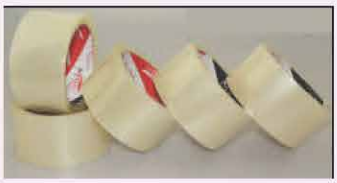
The carton boxes are used to pack the individual pack pressed garments. It is a box made of different no. of paper layers. According to the no. of layers, the strength of the carton is determined. There are different thickness of cartons available in market. The 3 ply, 5 ply, 7 ply etc. are referred the no. of layers. According to the no. of layers or ply, the strength of the box may be increased or decreased. The details like net weight, Gross Weight, dimensions of the carton, port etc. will be printed in the cartons boxes. (Fig 23)

Fig 23

### l Cellotape

This is used to seal the carton boxes in the final stage of the packing process. It is made of poly ethylene product and are available in roll forms with different widths. (Fig 24)

Fig 24




### Method of bulk packing

There are two methods of bulk packing. They are,

1 Carton Packing

2 Container Packing.

### 1 Carton Packing

This is the commonest method of packing. Carton Boxes are in various thickness like 3 ply, 5 ply to 9 ply used in this method for shipment. The folded pieces which are in poly bags are packed in the carton boxes for security. Gunny bags and poly sheets are sometimes used outside and inside of the carton boxes for extra safety. The carton boxes are closed with the help of Cellotapes and Nylon tapes. The carton box size and no. of pcs. Per Carton box will be as per the buyer's requirements. Some buyers are needed inner carton boxes which are smaller in size for extra protection. (Fig 25)

Fig 25

### 2 Container Packing.

This is the easy method of packing. Here Big steel containers are used to pack the garments. With the help of this method, there is no necessity of using carton boxes and other supporting items. Specialized Containers are also available for garments packing. Here, big nylon ropes with many no. of loops are available and the garments which are in hangers will be straightly hung in the loops. (Fig 26)

Fig 26

# Pressing technology

**Objective:** At the end of this lesson you shall be able to
- **explain about pressing and its technology.**

### Principles of pressing technology

It is important to press the garments during and at the end of their production for giving shape and better finish. Pressing is also very important to give luster to the garment for better presentation and packing.

### Classifications of Pressing.

Pressing can be classified in to two types.

a Under Pressing

b Top Pressing.

### a Under Pressing.

This is the term used to describe the pressing operations performed on garments while they are being made up. For example. While manufacturing a shirt, Pocket should be pressed for getting good shape before attaching with the Front part.

### b Top Pressing

This refers to the finishing operations which a garment undergoes after being completely assembled. Example, A completely sewn tops is pressed for packing process.

The above both groups involved a large no. of individual processes and their applications determined by the cloth, quality and design of the garment. But, the following basic components of pressing are the same.

### Components of Pressing

### 1 Steam

Steam and heat are necessary to relax the fabric and make it pliable enough for fixing the correct shape and size of the garment. The combined effect of steam and heat is to slightly soften the fabric structure to get the required effect.

### 2 Pressure

When the cloth has been relaxed by steam, pressure is applied which sets the fibres into their new position. An example of the combination of steam and pressure is the pressing of a crease in a Trousers.

### 3 Drying

After the application of steam and pressure, the component or garment must be dried and cooled so that the cloth can revert to its normal moisture content and stable condition. This is achieved by vacuum action which removes the surplus water in the fabric and cools it at the same time. For some pressing operations, hot air or infra-red heating is used instead of vacuum for drying.

### 4 Time

The length of time that the garment is subjected to steam, pressure and drying depends on the fabric and part being pressed, there is an optimum time for each component.

### Pressing Machinery and Euipments.

The design and development of Pressing machineries and equipment is never ending since the invention of the first mechanically operated pressing machine in 1905. Today, there are over 500 different types of general and special purpose pressing machine ranging from those for one simple operation to combination machines capable of performing every operation required for a garment (Ex. Men's Jacket). Some of the items of machinery and equipment in general use are:

### 1 Electric Irons

These are light weight irons weighing about 1.4 Kg with a heat range of between 70 and 240 degree Celsius and electronic temperature controls that have a reliable accuracy of + or - 3 degree Celsius. This type of iron is made in a variety of shapes and is mainly used for smoothing or finishing operations where steam is unnecessary. If, for some reason dampening is required, distilled water can be finely sprayed on to the area with spray pistol operated by compressed air. (Fig 1)

Fig 1

STN223741

### 2 Electric Steam Irons

Electric Steam pressing machines are widely used in industries. These are the most commonly used type of hand irons and carry out a wide variety of operations, especially those concerned with under pressing. A steam pressing machine consists of an iron box, a steam generating unit and an exhausting arrangement. Here pure water is converted into steam for pressing the garments.

The iron has a heating element, and steam is fed from a central or independent boiler into the steam chamber in the base of the iron. The steam is superheated by the element and released as required through perforations drilled in the iron soleplate. A micro-switch in a convenient position at the side of , or within the handle release the steam. Also an exhausting arrangement with a fan is used below the pressing table which is used to release the steam air by penetrating through the garment being pressed.

These machines are also equipped with well cushioned ironing table with sleeve board. The advantages of steam pressing machine are,

- Less Weight
- Ladies also can easily operate
- No need of applying water

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- Very good finishing
- Give very higher production

The main care of this machine is requiring proper maintenance. Otherwise severe accident will occur due to the burst of the boiler. (Fig 2)

Fig 2

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### 3 Hot air irons

Here, air is heated and hot air is used for pressing. This is not a popular one because it less effect and complicated mechanisms.

## Finishing and folding

**Objective:** At the end of this lesson you will be able to
- **explain the importance and basic technique of finishing a garment.**

Finishing is a very important operation after stitching a garment. It adds to the quality because it gives a better look. Finishing can be grouped into trimming, ironing and folding. Sometimes washing of a garment is also done during the finishing process.

**Trimming:** Trimming is a process of cutting off unnecessary threads from the finished garments. For each garment there is a sequence that should be followed in order not to miss out any section. Start from the upper sections to the lower section, eg. in case of a shirt the trimming starts from collar, to yoke, sleeves, bodice front and back, bottom hem and fasteners.

In the lower garment, start from the waist line (waist band) to plackets, pocket mouth, fork and hip line, side seams, inside leg to the bottom hem line. Before trimming, check the garment for missing stitches. At the end of trimming all loose cut threads must be removed from the garment.

**Ironing:** The main purpose is to remove creases which are formed during sewing. This gives a better look to the garment.

**Folding:** In case the dress can not be placed on a hanger it has to be folded. Basic techniques are described below. The **shirt** is placed on the table back side up.

– Both side seams are folded on the back so that they meet in centre.

– Sleeves are placed in the length of the shirt on either side.

– Bottom is folded back to a narrow width then the piece is folded to its half (lower folded edge should be slightly below the collar). (Fig 1)

**Trouser**( with center crease line): Before folding set the trouser by holding it on its waistband and let the pocket pouch and legs hang straight. Then hold the legs and match the inside seam and side seam of each leg. Then bring both legs together. And set the placket opening flat in its place. Then make three folds on the length. (Fig 2)

**Frock**: First close the plackets then place the frock with its back on top. Place both the side seams of frock on the center back. By doing so the lower shirt section will have slight overlap. Then place the sleeves on either side. Make the final fold in half. (Fig 3)

**Fig 1**

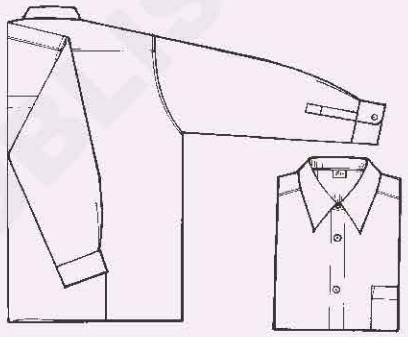

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**Fig 2**

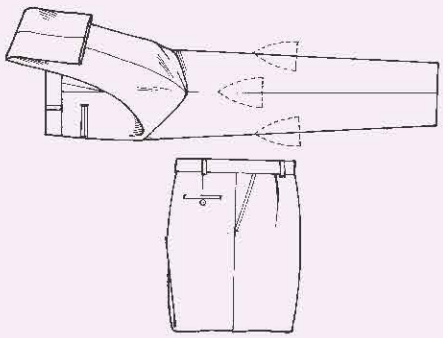

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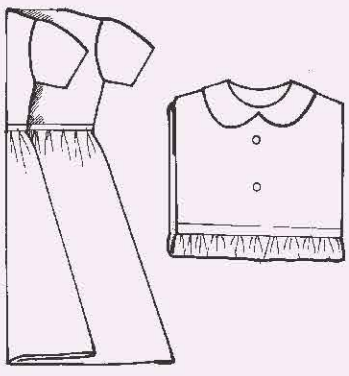
Fig 3



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## Sketching and drafting of the following garments

**Objectives:** At the end of this lesson you shall be able to
- **ladies tops with full sleeve and open collar**
- **explain the ladies top & style features styles.**

**Tops:** can refer to almost any upper body garment. The word tops most commonly refers to a women's shirt. Topis specifically a garment with a full vertical opening with bottoms; covering the shoulders but without sleeves or with short sleeves: with three quarter length sleeves: with long sleeves. Which may further be distinguished by certain type of simple collars like Peter Pan collar, open collar roll collar, etc?A simple tops with a plain skirt is the standard dress for the female. Tops are often made of cotton or silk material. They are generally more tailored than simple knit tops, end may contain feminine details such as ruffles or embroidered decorations. Ladies shirt have buttons reversed from theme's shirt that is the buttons are normally on the wearer left hand and the buttonhole are on the right hand side The style variations in tops may be created by modifying its following components.(Fig 1)

Fig 1

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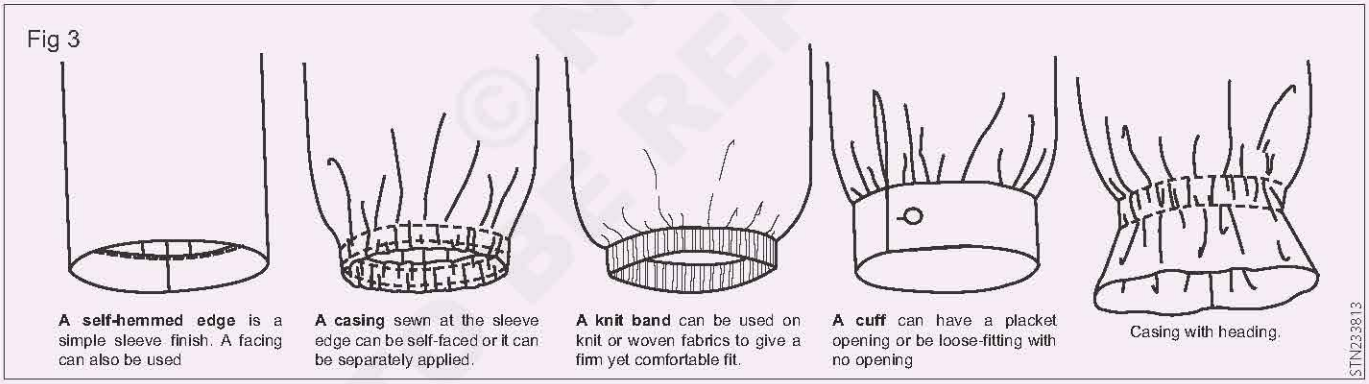
- Sleeves
- Pockets
- Trimmings

**Bodies:** The front body part of the top, can be prepared indifferent styles, the tops, it may be cut with shaped yoke part to vary in styles. It can be enhanced with different types of tucks etc. vertical full darts are taken at the front and back parts for fullness. Other than plain seam the sides of the tops cab are joined with flat fell seam to give decorative finishing. The top is stitched with either front or back, open.(Fig 2)

Fig 2

**Sleeves:** Various styles of half or full sleeves are suitable. The half sleeves can be cut 7 finished with piping, frills, fancy buttons, shaped hem, straps etc, the contrast color sleeve band or piping are, full sleeves are hem finished with cuff, the shirt cuff are often stitched with one piece packet or continuous placket. The sleeves can also be finished without cuff with casing with elastic attachment, gathering etc.(Fig 3)

Fig 3


A self-hemmed edge is a simple sleeve finish. A facing can also be used
A casing sewn at the sleeve edge can be self-faced or it can be separately applied.
A knit band can be used on knit or woven fabrics to give a firm yet comfortable fit.
A cuff can have a placket opening or be loose-fitting with no opening
Casing with heading.
STN233813

**Pockets:** the tops are either prepared with or without pockets. Patch pocket, slash in pocket flap pockets are some of the suitable pockets. (Fig 4 & 5)

**Trimmings:** the garments can also be decorated with variety of trimmings like lace, frills, ruffles, fancy buttons, ribbons etc.

Fig 5

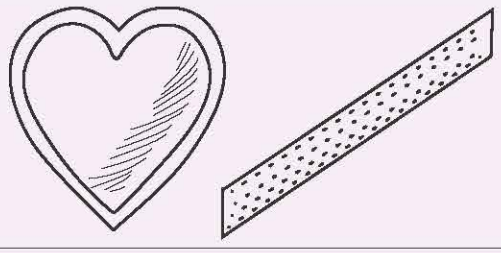
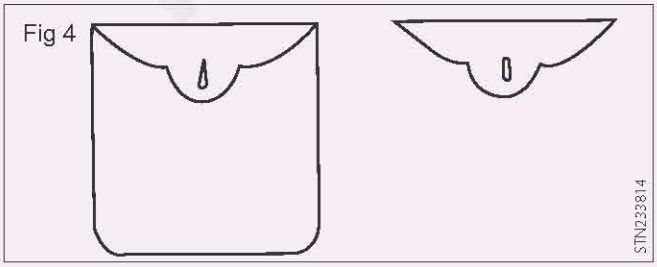



Fig 4

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# Sketching and drafting

**Objectives :** At the end of this lesson you shall be able to
- **describe about the ladies short kurthies**
- **explain the differemt styles & types.**

**Kurtis**

A kurta (or sometimes kurti, for women) is a loose collarless shirt worn in many regions of South Asia and now also worn around the world. Tracing its roots to Central. Asian nomadic tunics, or upper body garments, of the late-ancient- or early-medieval era, the kurta has evolved stylistically over the centuries, especially in South Asia, as a garment for everyday wear as well as for formal occasions.

**Styles**

A traditional kurta is composed of rectangular fabric pieces with perhaps a few gusset inserts, and is cut so as to leave no waste fabric. The cut is usually simple, although decorative treatments can be elaborate.[citation needed] The sleeves of a traditional kurta fall straight to the wrist; they do not narrow, as do many Western-cut sleeves. Sleeves are not cuffed, just hemmed and decorated.

The front and back pieces of a simple kurta are also rectangular. The side seams are left

open for 6-12 inches above the hem, also referred to as the chak, which gives the wearer some ease of movement. (Note: chak derives from the Persian "Fissure, cleft, rent, slit, a narrow opening intentionally left in clothes). The kurta usually opens in the front; some styles, however, button at the shoulder seam.

The front opening is often a hemmed slit in the fabric, tied or buttoned at the top; some kurtas, however, have plackets rather than slits. The opening may be centered on the chest, or positioned off center.

A traditional kurta does not have a collar. Modern variants may feature stand-up collars of the type known to tailors and seamstresses as "mandarin" collars. These are the same sort of collars seen on achkans, sherwanis, and Nehru jackets.

**Material**

Kurtas worn in the summer months are usually made of thin silk or cotton fabrics; winter season kurtas are made of thicker fabric such as wool or "Khadi silk", a thick, coarse, handspun and handwoven silk that may be mixed with other fibers. A very common fabric for the kurta pajama is linen, or a linen-cotton mix ideal for both summers and winters.

Kurtas are typically fastened with tasseled ties, cloth balls, and loops, or buttons. Buttons are often wood or plastic. Kurtas worn on formal occasions might feature decorative metal buttons, which are not sewn to the fabric, but, like cufflinks, are fastened into the cloth when needed. Such buttons can be decorated with jewels, enameling, and other traditional jewelers' techniques.

**Decoration**

Tailors from the South Asia command a vast repertoire of methods, traditional and modern, for decorating fabric. It is likely that all of them have been used, at one time or another, to decorate kurtas. However, the most common decoration is embroidery. Many light summer kurtas feature Chikan embroidery, a specialty of Lucknow, around the hems and front opening. This embroidery is typically executed on light, semi-transparent fabric in a matching thread.

**Kurti**

In modern usage, a short kurta is referred to as the kurti, which is the attire of females. However, traditionally, the term kurti refers to waist coats, jackets and blouses which it above the waist without side slits, and are believed to have descended from the tunic of the Shunga period (2nd century B.C.).The kurti is distinguished from the choli by the latter leaving the midriff exposed.

It is a typical dressing pattern of Indians especially the northern regions.

The trend and origin of this clothing style is from the northern India and even today the other parts of the nation though modernalized wear kurti but it is worn by females majorly in north while the south prefers saree.

There are a number of styles of kurti which include the following

**Punjabi kurti**

In the Punjab region, the kurti is a short cotton waist coat [4] which is buttoned down the front to the waist. In the past, women wore a chain of gold or silver called zanjiri around the buttons. Men wore the zanjiri on the kurta in the Punjab region.

Another style of Punjabi kurti is a short version of the anga (robe).The kurti can also be half or full sleeved and hip length with no front or back opening. Men's kurti is called

phatui or waistcoat in Punjabi. The kurti of South Punjab, Pakistan is referred to as the saraiki kurti.

Based on the wish of the consumer the length of the kurti can be decided.

**Bihari kurti**

In Bihar, the term kurti is used to refer to a bodice which is a combination of the choli and jacket.

**Uttar Pradesh**

The kurti in Uttar Pradesh and the adjoining Himalayas region is a short blouse

**Gujarat**

In Gujarat and Kathiawar, the type of kurti (coat) falls to just below the waist.

**Rajasthan**

The men's kurti in Rajasthan is a full sleeved, tightly fitting, buttonless vest

# Ladies' suit - Style 1

**Objectives :** At the end of this lesson you shall be able to
- **explain commonly used kameez and various styles**
- **explain the types of darts and explain their constructional features**
- **explain the salwar**

## Kameez

Kameez is also referred to as kamiz or qamiz. Kameez is a long shirt or tunic, with short slits at either side of them, known as the cheek. This leaves the wearer with freedom of movement and ease of wear.

The kameez is normally most embellished in a salwar kameez suit. The style is entirely dependent upon the tailors the designs that can be achieved are quite remarkable. The kameez comes in a variety of fabrics and sizes, with long or short sleeves, a wide variety of buttoned, collar, beaded, round and square necklines and with lace and piped finishes at them.

The kameez has evolved tremendously from the traditional style which usually consisted of a long dress with longsleeves. They now come in a variety of styles and designs, having been influenced by popular designers all over the world.

### Kameez varies as

1 Short kameez length with short sleeves.

2 Short kameez with sleeveless.

3 Different neck styles.

4 Different back designs and back depth

The salwar kameez is known all over the world. Basically traditional kameez salwar, curdier salwar kameez, princess salwar kameez, parallel salwar kameez are popular Indian salwar kameez (Fig 1).

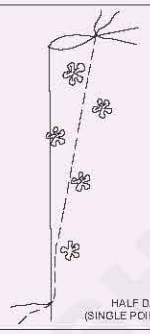
Fig 10

Materials like poplin, cotton, synthetic, satin, linen, silk,etc can be used for kameez. Trimming like hooks & eyes,zip, press buttons, fashion buttons, lace, fashion loops canbe used. An open can be given in front or back. Slits are given both the sides. (Fig 2)

Princess line kameez is a kind of dress that was used only by the queen in the past. But later it was used by all kinds of women also.

Princess line cut is the one that starts from the centre of the armhole and comes over the bust point and when it comes over the bust point and when it comes at the bottom a cut is made to make a flare. Since this line is cut following the dart, a tight fitting effect is produced and it also increases the width of flares.

Fig 11




Princess line cut is also made from the shoulder, which is called as six piece kameez. This is similar to princeless line kameez. A line is cut from the shoulder over the bust till the bottom. This kind of kameez can be used by women of all ages.

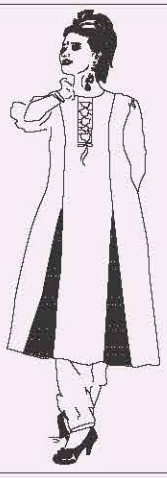
### Designing the princess line kameez

Princess line cut can be given in the front side alone and if necessary princeless line cut is used at the back, loops can be provided and a tape is inserted into those loops and it is tightened. This gives a fashioned effect. This kind of kameez is mostly liked by women of young age. Prince less line cut can also be done in short kurtas, tops and cholis, etc.

There are also some other kinds of princess line kameez.

A godet is given from the waist to the bottom to give more flares. (Fig 1)

Fig 1




In another kind of princeless line cut, yoke is stitched in the front upto the waist. From waist to the bottom a godet can be introduced to give more flare. A contrasting material is used for a godet. (Fig 2)

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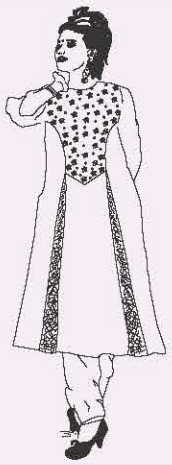
Fig 2



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In another kind, not only a single princeless line cut, two or more princess line cut can be provided.(Fig 3)

Fig 3

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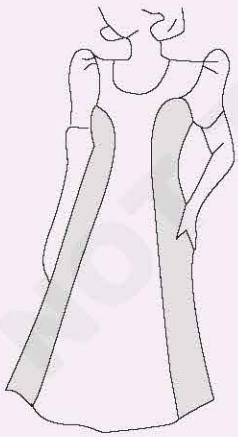
1 Lay the brown sheet on the drafting table with its wrong side facing upwards.

2 Draw the drafting of kameez front and back body part and sleeve part on brown sheet. (Fig 1)

Fig 1



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3 Give flare as show (Fig 2).

4 Draw sleeve on the folded brown sheet.

5 Use L-square and French curve / curve stick for perfect shape of drafting.

In the fig 4, two princess line cuts are made. In one of the princeless line cuts, pleats are made to make it shrink at the shoulder and then the loops are provided with tapes inserted into them.

Any kind of sleeves can be used in princess line kameez. Some of them are plain sleeve, puff sleeve, full sleeve, etc.

**Salwar**

Salwar or Salwar is cloth worn from the waist to the ankles, covering both legs separately. It is the lower-garment of the Salwar kameez suit which is widely-worn in South Asia. It is known for its lively hues, rich fabrics, and embroidery. It is also the national dress of Pakistan, since the later 1960s with the salwar being used in government offices in Pakistan. The outfit has been a part of Punjabi tradition for centuries. Salwar can be distinguished to the Punjabi suthan which is shorter than the salwar. Salwar originated in Central Asia and its use spread to South Asia.

- Types
- Afghani salwar - tends to be loose.
- Anarkali salwar - slim fitted salwar.
- Peshawari salwar - is very loose down to the ankles.
- Balochi salwar - has a very roomy salwar using large lengths of cloth.
- Punjabi salwar - is wide at the top but fits closely to the legs and is gathered at the ankles.
- Saraiki salwar - is very wide and baggy with many voluminous folds.
- Sindhi salwar- is plaited at the waist.

Salwar is a lower garment, with different regions having different types. The earliest form of the salwar originated in Central Asia and its use was spread to South Asia as well as the Arab world, Turkey and wherever the Turks established their empires in the 12th century. The Ottomans spread the use of the salwar throughout its empire. Salwar was brought in South Asia after the arrival of Muslims in the 13th century. It was first worn by Mughal nobles. The use of the salwar in the Punjab region has been the result of influences from the Middle East, Central Asian Turks and finally, the Afghans.

In India, there is a similar dress salwar known as suthaan which is shorter than the salwar. The Punjabi suthan suit which is made up of the head scarf, kurta/kurti and Punjabi suthan. Dogri pajama and the churidar. The term salwar kameez also includes the Kashmiri Phiran/suthan outfit.

In the Punjab region, the salwar was made using a large amount of material but had no pleats or folds. The large salwar eventually gave rise to the Punjabi salwar.

**Punjabi salwar**

In its strictest sense, the salwar is baggy and loose straight down the legs, and gathered loosely at the ankles. During the medieval period, people adopted the Iraqi style of salwar in Multan and neighboring Sindh. This type of

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salwar is traditionally very baggy and gathered at the ankles. It is still worn by the Kurdish community in Iraq.

The Multani salwar is similar to the loose Punjabi suthan. Therefore, the distinction between the loose Punjabi suthan and the loose Multani salwar is fine and centres on the tight ankle band in the suthan, and on the suthan beginning to fit closer to the legs below the knees.

The original Punjabi loose salwar was not as baggy as the Multani style but was wide, with the gathering at the ankles being wide enough to cover the feet. Originally, up to ten yards of cloth was used to make Punjabi salwars. The original Punjabi salwar was also not as baggy as other forms of the salwar, such as the type worn in Afghanistan (partug)), the Balochi salwar, or the loose Punjabi suthan, and gathers more quickly below the knees and ends in a tight band. Eventually the modern Punjabi salwar came into being which is slim fitting and does not have wide ends as before.

Another style of salwar is the Pothohari salwar of the Pothohar area of the Punjab region. The Pothohari salwar retains the wideness of the Punjabi suthan. The kameez is also wide. The chunni is a remnant of the large chadar popular in West Punjab known as salari and the large Phulkari worn in various areas of the Punjab region. However, the Pothohari salwar suit did not attain universal acceptance. The Bahawalpuri salwar is also wide and baggy with many folds. The material traditionally used for the Bahawalpuri salwar and suthan is known as Sufi which is a mixture of cotton warp mixed with silk weft and gold threads running down the material.

**Punjabi kameez**

The Punjabi kameez is also cut straight with side slits. This combination makes up the Punjab salwar suit outfit, which is very popular and was developed in the Punjab region.The Punjabi ghagra is now rarely worn. Before the development of the Punjabi salwar suit, the traditional dress of women of Punjab was the Punjabi Ghagra, Punjabi suthan and choli/kurti/kameez. The Punjabi salwar Suit is worn in the Punjab in India and Pakistan. It consists of the chunni (head scarf), jhagga (kameez) and the salwar when worn by women. The chunni can be of varying lengths. The jhagga (kameez) is made up of two rectangular pieces sewn together with side slits, similar to a tunic. A kurta is also worn.

The salwar is similar to pajamas or pants, wide at the top and tightened loosely around the ankles with hard material, called paunchay. In the Punjab, the salwar kameez is also known as the chunni jhagga salwar suit.

**Punjabi salwar suit**

In some parts of the Punjab region, especially the urban areas of Punjab, Pakistan, males wear the men's Punjabi suit. The upper garment is made of the straight cut kurta/ kameez and the salwar resembles a slim fit pajama. In the past, the suthan was also commonly worn by men, a trend which can still be seen in some parts of the region (especially Jammu and Himachal Pradesh).

## Ladies' suit - Style II

**Objectives :** At the end of this lesson you shall be able to

- **explain the churidars**
- **explain the types of sewing and cutting tools and name their application.**

**Churidars** are more properly churidar pyjamas, are tightly, are tightly fitting trousers worn by both men and women. They are a variant of the common salwar pants. Salwars are cut wide at the top and narrow at the angle. Churidars narrow more quickly, so that contours of the leg are revealed. They are usually cut on the bias (at a 45° degree angle) to the grain of the fabric. This makes them naturally stretchy. Stretch is important when pants are close fitting. They are also cut longer than the leg and finish with a tightly fitting buttoned cuff at the ankle. The excess length falls into folds and appears like a set of bangles resting on the ankle hence, churidars, churi, bangle, dar like. When the wearer is sitting the extra material the "ease" that makes it possible top bend the legs and sit comfortably. The word "churidar" is from Hindi and made its way into English. Earlies, tight fitting churidar like pants worn in India were referred to by the British as moghul drenches, long drawers or mosquito drawers.

19th century Indian women wearing churidar with a bodice and a transparent overskirt. Traditionally affised kathak dances from northern India, still wear churidar with a tight bodice; when the dancers twirl, the leg contours can be discermed as can be seen in many movies featuring kathak dancing.(Fig 1)

Fig 1

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Churidar is prepared with casing at the waist for interesting a cloth tape. It is worn with Khamis. Punjabi kurta, Jodhpur coat; sherwani etc. it is cut on bias material to get a nice fit below knee. For this, either a bias bag is prepared or it is cut on plain material. As gathers are required below calf, the length 4-2 is increased at the bottom.

The churidar has more length if we compare with traditional salwar length. Because wrinkles come on the ankle in churidar salwar. The top part has the belt like traditional salwar kameez and pleats also.

In churidar salwar, the upper portion of the salwar is not wide spread like traditional salwar, it is 10-14cm loose than the hips measurements. There is tunnel on the top portion for drawstring like the traditional salwar.

In totally churidar salwar has a leg shape with few inches margin for leg movements.

Material like, cotton, poplin, kadi can be used for surwar. The length of the material required is twice the full length measure, when the width is nearly the same as the seat measure. If width is less, the length should be increased accordingly. Trimmings like use hooks, press buttons, tape can be used in surwar.

Faced placket can be used at the back for opening. Zip can also be used for the open at the back.

Any kind of neck shape can be given for this kind of kameez. The different types of fabrics used for this kind of kameez are cotton, poplin, synthetic, satin, etc.

Embroidery may be done or bead work can be done or fashion buttons can also be provided in or near the neck to decorate the front side of princeless line kameez.

Darts are one of the most basic structural elements in dress making. Darts are necessary because the body is not straight and flat but curved. A dart is used to shape a garment around the contours of the body and to allow freedom of movement, comfort to the wearer and also to make the garment look attractive. Darts are used mainly on women's dresses to allow fullness at the bust, hips, shoulders and elbows.

**Anarkali Salwar Suit**

Fig 1

Anarkali Salwar suit is a form of women's dress originating from Lahore. The Anarkali suit is made up of a long, frock-style top and features a slim fitted bottom. The Anarkali suit varies in many different lengths and embroideries including floor-length Anarkali styles.

Anarkali suits owe their name to the fictional Anarkali, a courtesan in the court of Mughal emperor Akbar. In legend, she was murdered for her illicit relationship with the Crown Prince Salim, who later become the Emperor Jahangir.

The word Anarkali literally means the 'delicate bud of the pomegranate flower/tree'. This name signifies the qualities of softness, vulnerability, innocence, and beauty associated with the women who wore Anarkalis.

**Types of Anarkali SuitsEdit**

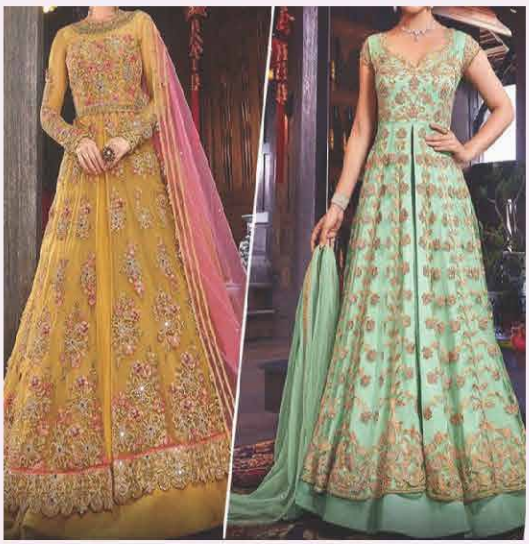
The following are some of the different types of Anarkali Suits.

- Floor-Length Anarkali Suit
- Pakistani Anarkali Suit
- Cape Style Anarkali Suit
- Jacket Style Anarkali Suit
- Layered Anarkali Suit
- Gown Style Anarkali Suit
- Palazzo Anarkali Suit
- Churidar Anarkali Suit

**Types of Anarkali Salwar Kameez that should Grace Every Woman's Wardrobe**

**1 Floor-Length Anarkali Suits**

Fig 2



You cannot have just one. This is the signature style Anarkali, which is also a popular choice amongst the Bollywood celebs and the country's fashionistas. The floor-length suit is the most favored Anarkali type in the middle-eastern countries too. You will find a wide range of styles, fabrics, price range in this particular type of Anarkali, including asymmetrical (most common), jacket, Pakistani, palazzo, and cotton, silk, chiffon, net, handwoven, and

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embroidered. Shopkund even allows you to customize your own floor-length gown to match your style.

### 2 Pakistani Anarkali Suit

Fig 3

It all started from here, from Lahore, the place where Anarkalis redefined Indian fashion and created a scintillating twist in the salwar kameez trend. The Pakistani Anarkali suits are a timeless piece of royalty, elegance, magnificence, and any other adjective you can possibly think of prefixing before a beautiful suit. Pakistani Anarkalis are heavily embroidered, most often accentuated by a jacket or several layers of fabrics. They are donned during weddings and other grandeur functions. If you want something that is 'not-of-the-box' yet not an 'everyday affair', then go for Pakistani sensibilities collection.

### 3 Cape Anarkali Suits

Fig 4

Cape style Anarkalis have just emerged as trending ethnic wear for petite and lanky women. Cape Anarkalis come with attached cloak-like sleeves that work as a sleeve as well as a dupatta. If the cape is long, a dupatta is generally not required. The dress makes women look fuller and curvier, making it perfect for women craving for both.

### 4 Jacket Anarkali Suits

Fig 5

If you had to makeover your Anarkali suit, add a jacket. Jacket Anarkalis are upbeat for they can be worn as frocks as well as salwar kameez. You can pair them up with pants, long flared skirts, and even palazzos. In fact, few jacket suits come with a detachable inner kameez, which ideally makes the outfit two different dresses.

### 5 Layered Anarkali Suits

Fig 6

Layered Anarkali Kameez is the epitome of a wedding trousseau. If you are not a saree person and want to ditch the traditional lehenga as well, the layered Anarkali should be the perfect choice of attire to bring out the bridal glow in you. Layered Anarkalis generally come with vibrant colors and royal designs for weddings. They are most often made out of net fabric with silk lining and heavy embroidery works. If you want to skip heartbeats, then buy one now.

### 6 Gown Style Anarkali Suits

If you want the best of both the worlds – the Indian and the western, try the glamour-evoking Anarkali gowns. Anarkali

gowns are the successor of the quintessential cocktail or reception gowns, but with a richer look that goes beyond net-based fabrics and designs. Since Anarkalis have an Indian root, you can find an astonishing range of Anarkali gowns, made out of lace, sequins, embroideries, chikankari, prints, and so on. They come in more than 20 types of fabrics as well, including Benarasi, Kanchipuram silk, Jodhpuri cotton, chiffon, cotton, and georgette.

Fig 7

### 7 Palazzo Anarkali Suit

Fig 8

The Palazzo Anarkali suits are giving us a major fashion goal these days. Right from Bollywood celebs to world-renowned influencers, the palazzo-salwar kameez combination has imbibed an uncanny fashion sense that is hard to resist. So what makes the palazzo Anarkali suit enticingly very out-of-the-box? They can pass off as casual attire, party-wear, and even as office wear. You can't stop with just one purchase. They come in a variety of edgy and quirky designs. They are affordable and low-maintenance, just like cotton Anarkalis. Palazzos also make women taller and slimmer. Plus, you can style them up with long jackets during winter and make them modernly-traditional.

### 8 Churidar Anarkali Suit

Fig 9

Chudidar Anarkali suits are evergreen and definitely everlasting. Just like the gowns, churidar Anarkali suit is a signature style that is embraced by all of us, both off and on-screen. Churidar Anarkali suits usually are not as lengthy as the rest of the salwar kameez. They are often knee length or ankle length and paired with a dupatta and legging or churi-pant. Churidar style Anarkalis are now redefined into column dress style (with a waist-hugging belt), short, sleeveless jacket san the dupatta, and asymmetrical, flowy Anarkalis.

They can be worn for a multitude of occasions because they are available in different, easy on pockets price range. Churidar Anarkalis are one of the fast-selling salwar kameez suits.

## Night wear

**Objective:** At the end of this lesson you shall be able to
- **describe about the night wear**
- **explain the nighty and their different styles**
- **explain the house styles and their suitable fabric.**

**Ladies night wear** : This garment is worn while in bed, so it is called night gown. It can be wear with sleeves or without sleeves. The full-length varies according to taste. In the particular nightgown, gathers are taken above the bust, to make it roomy at the front. At frills or gathers trimming lace are used for decorative purpose. The back can be finished without gathers. It is usually made from nylon or synthetic elasticized fabrics, but for everyday wear cotton is preferred.

Ribbon bow is used for decorative purpose. Side slit can be used at bottom for wearing convenience. Front open at yoke as a placket. This placket may be finished with zipfastner or button and loops or hooks and eye.

**Frills:** Frills or ruffles can be prepared with contrast colour fabric to decorate the garment.

**Pocket and fasteners:** Two separate belts are joined at the waist. The waist is suppressed by tying these belts. Patch pockets can be attached. It is generally made form handloom or printed cotton for day to day wear. At pocket you may attached frills or lace for decorative purpose. Fashion buttons or press buttons can used for fastening. Hand embroidery and machine embroidery may use for this garment.

**Nigh wear style 1**

A nightgown, nightie or nightdress is a loosely hanging item of nightwear, today almost exclusively worn by women. A nightgown is made from cotton, silk, satin, or nylon and may be decorated with lace appliqués or embroidery at the bust and hem.

A nightgown may have any neckline, and may have sleeves of any type, or be sleeveless, and any shoulder strap or back style. The length of a nightgown may vary from hip^length to floor-length. A short nightgown can be called a "shortie" or a "babydoll", depending on the style. The sweep (taper from top to bottom) of the night gown canvary from virtually straight, to full circle sweep, like the Olga gown. A slip nightgown may be used as a nightgown or as a full slip. Nightgowns may be worn with a matching outer garment, a robe, sheer chiffon peignoir or dressing gown, to make them appropriate for receiving guests.

There is no indication whether the term referred to sleepwear or an item of clothing with a different purpose, however. There, additionally, is little evidence of designated sleepwear prior to the 16th century. Some historians suggest a lack of record of early sleepwear is due to social attitudes. Sleepwear was widely regarded as a private matter within households until it became more popularized.

Modern nightgowns originate from nightshirts on men, or night-chemises on women which date back to as early as the 16th century. Nightshirts and night-chemises tended to just be day shirts or undergarments and were similarly ankle-length, shapeless articles with varying collars. Nightshirts resembled tunics; worn by both sexes for centuries in Egypt and Rome. They tended to be made from white linen so as to be easily washed andabsorbent. Nobles and Lords however wore nightshirts that were embroidered.

It was not until the late 17th century that sleepwear developed its own identity in Western Europe, and higher-class women began to wear chemise-like gowns exclusively to bed, known as nightshifts. Nightshifts developed more shape when the negligée was born in France in the early 18th century. The negligée was typically made with soft-sheer fabric and was tighter around the waist, but still loose-fitting for comfort. It was also a sign of wealth and is regarded as the first women's nightwear to be used widely and a predecessor to the modern nightgown. According to historians Willet and Phillis Cunnington, only small adjustments were made to nightdresses up until the late 19th century because of social attitudes; trimmings of lace or tighter fits were viewed "as a sign of depravity that went against the highest principles of prudery in the English lady".

**Nightgowns as dressing gowns: 18th and early 19th centuries**

Prior to the late 19th century, the term "nightgown" referred not to sleepwear but rather to informal wear. The nightgown was a "version of a modern dressing gown" and tended to be worn around the house or to occasions when formal attire was not necessary. This garment was actually a banyan, a T-shirt shaped robe adopted by the British from India but became known as a "nightgown", dressing gown or "morning gown" in the early 1700s due to its casual nature.

Nightgowns, or dressing gowns, were predominantly worn by men. English variations of the nightgown or dressing gown were influenced by similar gowns from India, Japan and the Middle East. In the early 18th century, the kimono style became popular. It was loose fitting and fit over men like a coat. The gown "consists of two widths of fabric seamed at center back up to the neck, where it joins a small rectangle of fabric to build up the neckline. Each width of fabric then falls over the shoulders to create the gown front. Additional widths of fabric form the sleeves. V-shaped inserts could be sewn at the side seams for additional fullness." Nightgowns were also typically made from cotton or silk (damask, brocade, velvet, taffeta, and satin) or wool with linings using satin or lutestring in a bright, contrasting color. The material varied based on the weather and the person wearing the gown. In colder seasons, nightgowns would have fur linings. Trade throughout Europe and Asia from the 16th to 18th centuries led to the foreign fabrics and styles used for nightgowns in Western Europe and America. Exotic associations popularized the nightgown, especially in the kimono or banyan style.

Fashion historian Patricia Cunningham has also suggested "the cut of the gown may derive from Persian and Turkish caftans".

**21st century**

In the 21st century, nightgowns are predominantly worn by women. Common modern nightgown styles are made from cotton, satin, silk or lace and have embroidery or lace details with thin shoulder straps. Nightgowns have several different variations. Longer, cotton nightgowns are often referred to as "Victorian Nightgowns", having been influenced by similar styles in the late 19th century. Shorter nightgowns are also known as "nighties" and a common style is the "baby doll" nightgown which is generally lace and silk with a V-neckline. Other variations are the "shirt style" nightgown or the "slip dress" nightgown.

**Nightwear includes**

- Adult onesie - all-in-one footed sleepsuit worn by adults, similar to an infant onesie or children's blanket sleeper and usually made from cotton
- Babydoll - a short, sometimes sleeveless, loose-fitting nightgown or negligee for women, generally designed to resemble a young girl's nightgown.
- Blanket sleeper - a warm sleeping garment for infants and young children.
- Chemise - when used in reference to sleepwear, it is a delicate, usually provocative, loose˄fitting, sleeveless, shirt-like lingerie
- Negligee - loose, sensuous nightwear for women usually made of sheer or semi-translucent fabrics and trimmed with lace or other fine material, and bows.
- Nightcap - warm cloth cap worn by women, men and children with pajamas, a nightshirt or a nightgown.
- Nightgown - loose hanging nightwear for women, typically made from cotton, silk, satin, or nylon.
- Nightshirt - loose fitting shirt, much longer than a regular shirt, reaching to below the knees.

**Worn by men, women and children.**

- Pajamas - traditionally loose fitting, two-piece garments for women, men and children.
- Peignoir - a long outer garment for women usually sheer and made of chiffon. They are usually sold with a matching nightgown, negligee or panties.

Other types of garment are commonly worn for sleeping, but not exclusively so, including gym shorts, t-shirts, tank tops, and sweatpants, and as well as underwear, such as long underwear and briefs, with no outer garment, and socks. Also, sleeping without clothing is not uncommon.

**House coat**: House coat is a long, loose lightweight robe for informal wear around the house. It is a one piece garment covering from shoulder to ankle, with full opening at the front. It is prepared with full or half sleeves. The garment is generally prepared with open collar but peter pan or shawl collar are also suitable. It consists of two separate belts stitched at the waist, at both side seams to tie it at the front. The tied belts suppress the waist, to give shape to the garment without darts. The front open is fastened with sew through buttons, patch pockets are attached if required. Handloom or printed cotton are suitable fabrics for stitches house coat.

**House coat**

A housecoat or morning gown is a robe, a loose-fitting outer garment, worn by either men or women. They are similar to a bathrobe but without the absorbent material.

A dressing gown or a housecoat is a loose, open-fronted gown closed with a fabric belt that is put on over nightwear on rising from bed, or, less commonly today, worn over some day clothes when partially dressed or undressed in the morning or evening (for example, over a man's shirt and trousers without jacket and tie).

Fig 1

A House coat form the 1850s

Dressing gowns are typically worn around the house. They may be worn for warmth, as a convenient covering over nightwear when not being in bed, or as a form of lingerie. A dressing gown may be worn over nightwear or other clothing, or with nothing underneath. When guests or other visitors are expected to enter the household while the host(s) are partially dressed or undressed, the hosts may put on additional clothing, such as a dressing gown.

The regular wearing of a dressing gown by men about the house is derived from the 18th-century wearing of the banyan in orientalist imitation.The Japanese yukata is an unlined, cotton kimono worn as a bathrobe or as summer outdoor clothing. By the mid˄19th century, dressing gowns were used equally by both men and women as at-home wear. This gave men the opportunity to add color to their somber everyday wardrobe.

For women, wearing a dressing gown was a break from tight corsets and layers of petticoats. Ladies wore their dressing gowns while eating breakfast, preparing for the day, sewing or having tea with their family.

In 20th century the idea of sitting around all day in a robe became less appealing and was considered as a sign of laziness. In the 21st century not many people own or wear dressing gowns but some still like to change into something comfortable from time to time.

**Bathrobe**

A bathrobe, also known as a housecoat or a dressing gown, is a loose-fitting outer garment (a robe) worn by people, often after a washing the body or around a pool A bathrobe is a dressing gown made from towelling or other absorbent fabric and may be donned while the wearer's body is wet, serving both as a towel and a body covering when there is no immediate need to fully dress.

Fig 2

**Fabrics and fibre types**

**Fabrics**

**Bathrobes can be categorized by the weave of their fabric**

- Flannel: Flannel is a soft woven fabric, made from loosely spun yarn, usually cotton or wool.
- Terrycloth: Terrycloth is a pile fabric, usually woven of cotton, with uncut loops on both sides, used for bath towels and robes. The longer and denser the loops are, the more absorbent the bathrobes are.
- Velour: Velour is a pile fabric where the loops woven into the fabric have been cut. Velour bathrobes are typically made with a terrycloth lining, as terrycloth absorbs water better than velour. Velour can make a bathrobe appear more luxurious, cosier, and makes the garment soft to the touch.
- Waffle fabric: Waffle fabric has good water absorbency, with a lightweight weave and a distinctive "gridlike" appearance. These bathrobes are designed for their light weight over their absorbency.

**Bathrobes and bathrobe fabrics can also be categorised for their fibre types, and are generally made of four different fibres**

- **Cotton:** Cotton is a natural fibre consisting primarily of cellulose and is one of the most

  commonly used fibres in textile manufacturing. Due to the hydrophilic nature of cellulose,

  cotton absorbs water easily and is frequently used by the beach, pool, or following a shower.

  Cotton robes are especially suited to use in hot climates because cotton tends to absorb perspiration.
- **Silk:** Silk dressing gowns are popular because of their look and feel, but can be relatively expensive. Silk robes are very thin and lightweight, and are not particularly suited to wet situations because they lack the surface area and polarity necessary to absorb water. However, silk dressing gowns are the traditional choice, since they are not worn after bathing.
- **Microfiber:** Microfiber is an extremely fine synthetic fiber, typically made of cellulose or polyester, that can be woven into textiles to mimic natural-fiber cloth. Modern microfibers are developed to maximize breathability and water absorption and can be thinner than the width of human hair. Much like silk, robes made out of microfiber are light in weight and are very soft to the touch. Microfiber is flammable.
- **Wool:** Wool bathrobes are common in colder climates.
- **Nylon:** Nylon is a synthetic fibre occasionally used in inexpensive dressing gowns. It is valued for its ability to be cleaned easily.

**Design and construction**

Fig 3

Woman's kimono-style dressing gown with a sash, made in Japan for the Western market, late 19th-early 20th century.

Most bathrobes are designed as a wrapped-front garment with belt loops and a matching belt, intended to be tied around the waist to hold the garment closed.

However, bathrobe designs vary, typically in collar and closure design, with some garments featuring an open front or fastened closures in place of a belt. Varieties of collar design include:

- **Shawl collar:** So-called because the collar closes around the neck like a shawl. The shawl collar is borrowed from its use on men's evening wear on the dinner jacket and smoking jacket, and is common on traditional dressing gowns.
- **Kimono collar:** Similar to the collar found on the kimono, a traditional Japanese garment, the collar forms a thin strip of consistent width, wrapping around the front in a Y-shaped manner.
- **Hooded:** A hood is sewn into the neckline, which can be worn over the head to keep it warm and help to dry wet hair.

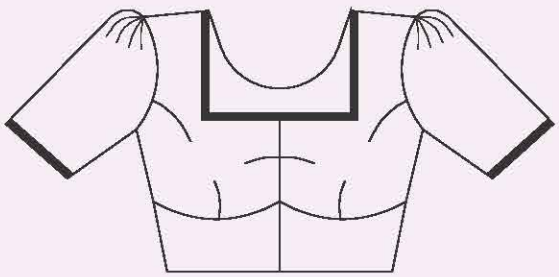
# Ladies' sari blouse - Style I and II

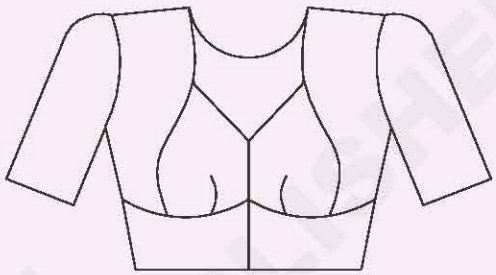
**Objectives:** At the end of this lesson you shall be able to
- **explain the different features of blouse**
- **describe blouse bodice and sleeves to create different style.**

**Blouse** is a kind of tops worn by women covering the body from neck / shoulder more or less to the waistline, with or without collar and sleeves. It is a midriff - baring garment worn in india, Srilanka, Bangladesh etc. It is worn in combination with sari. Sari - blouse is an Indian traditional costume. The blouse is cut and stitched to fit tightly to the body. Usually, the garment is prepared with two - piece placket at the centre - front or sometimes at the centre - back. The placket open is often fastened with hook and thread eye fasteners, where as it can also be fastened with sew - through buttons if desired.

Style variations in blouse is created with modifications of its components like (Fig 1)

Fig 1





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- Dart
- Back bodice
- Front bodice
- Sleeves

**Dart** plays an important role in blouse. The darts taken around the apex of the bust, gives nice fit. Blouse is stitched with one to four darts at the front part (Fig 2) and two darts at the back part one on each side. The size of the dart depends upon the body shape. It is advisible to taken four darts for a figure with prominent bust. Now - a - days blouse is also stitched in knitted fabrics to give tight fitting without darts.

**Back bodice** - The back bodice of blouse is normally cut and stitched in the same style with two darts. High neck blouse is an exceptional style where, the back part of the garment is raised a little higher than usual proportions. The back bodice may also be finished with decorative embroidery works, beads or with ropes to be knotted and various other such designs (Fig 3).

Fig 2

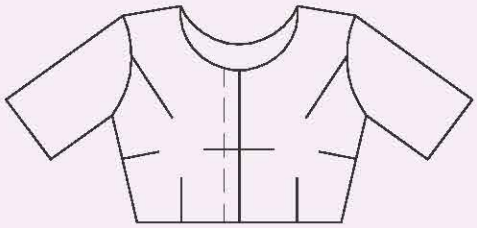

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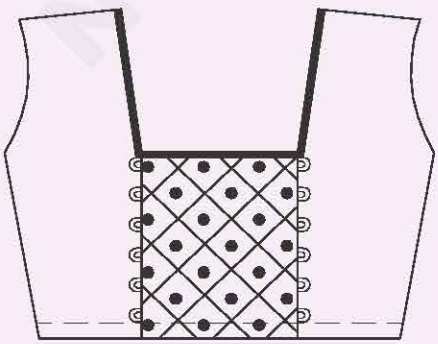
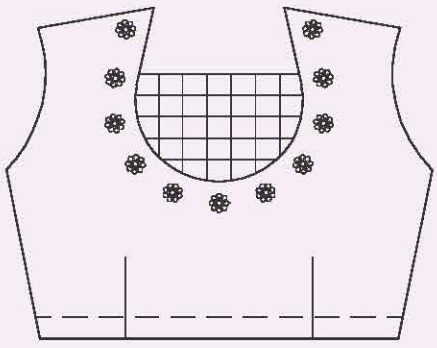
Fig 3





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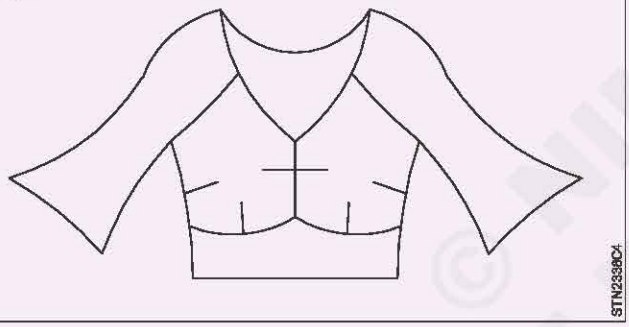
**Front bodice** - Unlike back bodice, the front part is not stitched with decorative finishes, as it will be covered fully by the saree worn. It is advisable to cut on bias fabric. But, it is cut in different styles to give perfect fitting. It is stitched either with or without waist belt . **Knotted blouse** is prepared without plackets but with a two cloth strips to be knotted at the centre front. **Katori blouse** is stitched without dart instead the front bodice is cut into different katori components and joined to give nice fitting at bust. Two seperate cut pieces (upper katori & lower katori) and waist belt stitched with the side piece forms the front bodice. This type of blouse is generally worn in Northern India. **Semi katori blouse** is stitched with one cup piece or katori.

**Sleeve** - Blouse is stitched with or without sleeves. Normally short sleeves are preferable where as too shorter sleeves and full sleeves are also suitable. Puff sleeves, flared sleeves, piped sleeves etc will give decorative look. It can be designed to suit the blouse design with ropes, beads, loops etc. The sleeve bottom is finished with a hem. **Raglon blouse** is prepared with raglon sleeves. (Fig 4)

Fig 4




**The style features of blouse selected for stitching**

**Blouse I**

**Plain blouse**

a Binding at neckline

b Four bodice with four darts

c Front open placket

**Blouse II**

**Katori Blouse**

a Front bodice with belt

b Katori pieces

c Front open placket

**The material required for stitching blouse**

**Plain blouse**

2 length + 1 sleeve length

**Katori blouse**

2 length + 1 sleeve length

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# Dress for a baby - Style I & II

**Objectives:** At the end of this lesson you shall be able to
- **explain the jabala and their types**
- **explain pattern working and safety precautions while creating and cutting a paper pattern**
- **explain the features of a layout and state the working precautions for cutting on fabric.**

**Jabala,** the basic children's wear is also stitched with open. Front open is mostly preferred for convenient wearing of the garment to the child. In some cases, back open is also preferred. The jabala placket is always finished with safe fasteners like fabric made buttons and buttonloops, hook and loop tape etc.

**Avoid using metal fasteners or buttons.**

The hook and loop tape attachment makes dressing easy for little ones, as fastening needs little dexterity and they are harmless. The neckline and armholes are often finished with facing or bias binding.

### Requirements of children's clothing

The ideal baby clothing should be:

- Soft, comfortable, easy to put on and take off and comparatively loose.
- Easy access to his/her nappy because it requires frequent changing.
- Non-flammable.
- Lightweight.
- Non-irritating.
- Underclothes should be essentially made of organic fibres.
- Allow quick transmission of sweat from skin to environment.

### Types of fabrics-Based on fibre

Children's skin is usually very sensitive and can get affected by allergies easily; therefore, clothing

for kids should be selected very carefully . In addition to that, kids like to play and the nature of children's activities means that their clothes should be durable, suitable and flexible for lively little lives, as well as being easily machine washable as they will likely need to be cleaned frequently. So, choosing fabrics for children's that are long lasting and durable, and suitable for delicate children's skin.

### Synthetic Fabrics

Most of the synthetic fabric contain chemicals and dyes that cannot be washed out and making them more likely to trigger allergies. However, they do have advantages such as strength, being less likely to shrink and having lower costs. Due to the high chemical content synthetic fabrics is not suitable for children's clothing. But in many cases, avoiding synthetic fabric is completely can be difficult, expensive and limit choice.

### Comfortable

It is very important for children's clothing that the clothes should be comfortable. Make them select their own clothes. In this way they will be happy wearing what they select, this will add to their confidence and self-esteem and they will also develop their fashion sense. The fabric should be soft and smooth and not irritate the skin. The fabric should be light weigh

### Climate and fabric

Fabric should be selected according to the climate to make it more suitable and comfortable. Now-a-days organic kids wear are in high demand and gained popularity due to various reasons, the entire cloth is designed from high grade organic cotton, which allows the sensitive skin of children to breathe and prevent from rashes and allergies

### Category of kids

Kids are categorized according to the age group. The World Health Organization (WHO) defines a newborn, or neonate, as a baby under 28 days old .Generally kids are grouped according to their age. Newborn (ages 0–2 months): Newborn usually refers to babies from birth to about two months of age. During this age, the head does not correctly stand on their neck. Garments of new born baby should be selected with full opening of front or back.According to the seasons, the material should be selected, i.e., thick or thin. Normally soft materials with lightweight should be selected. Infant (ages 2 months – 1 year): Infants are babies from two months to one year old. Toddler (ages 1–4 years): Toddlers are babies from one year to four years of age. From the age of one, the average child loses fat until about the age of eight. This slimming down process is very apparent. Toddlers have very little waist shaping and protruding stomach. Such quality decreases the growing child and loses fat. Children (ages 4- 13 years) - Preschooler (ages 3–6 years) - schoolˆaged child (ages 6–13 years): - Manufactures decided to accept a 6 cm height interval as a base for coding scheme as this approximates to the average growth per year over this period. It is to be noted that the range of heights for any particular age group is larger than the amount of growth that occurs in any one year

### Ease of Dressing and Undressing

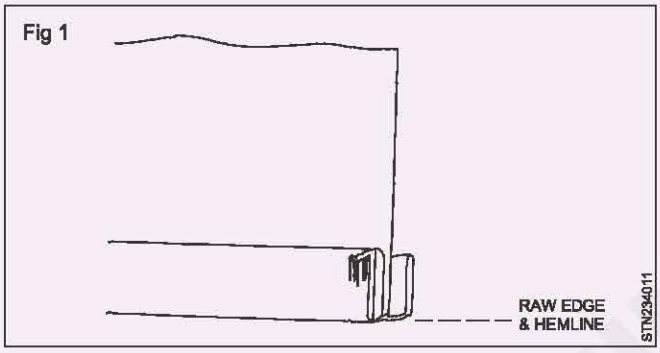
Fitted dresses should be avoided for kids, they tend to have larger stomach. Children wear must need sufficient seam allowances and must offer styles so that adults and children should be able to wear and remove the garment easily.

**Trimmings:** Trim can make a garment special look that a children like. Using decorative machine stitching, embroidery, smocking, ribbons, braid, ruffles etc. but always need to be care that hard materials having sharp edges should not be used in babies garments as it may harm the sensitive skin.

**Fasteners:** Children's clothing should not have drawstring as they have tendency to wind around the neck and cause danger [20]. Fasteners should not be attached in the wrong place which may hurt the child. They should be soft, warm and for babies elasticised garment should be avoided.

**Binding** is used to finish and straighten raw edges or to add a decorative trim to a garment. It is a neat finish also for reversible garments. It is used to finish neckline, armholes. Ready made bias binding piece can also be used. (Fig 1)

Fig 1




Bias bindings can be applied in two ways: **Single binding** is cut to double the finished width plus two seam allowances. Bindings are handled in the opposite manner to facings at inward and outward curves. Stretch bias on inward curves and ease it in outward curve. **Double binding** or **French binding** is used on sheer fabrics. Here the width is four to six times the required width. The binding piece is folded first and applied to the garment. It gives a corded effect when finished.

The style variations in jabala (Fig 2) can be brought down with some modifications like

1 Opening

2 Fasteners

3 Tucks

4 Trims

**Opening:**

The garment is stitched either with centre front or centre back full open. (Fig 3) Sometimes the opening is also placed at left side shoulder seam, (Fig 4) which is finished with fasteners like buttons and press studs. The placket is often finished with self facing or straight piece facing of same colour fabric. (Fig 3 and 4)

**Facings** are strips of cloth, straight or curved, which are used as designing aids on, in or at dress items. (Fig 5)

Fig 3

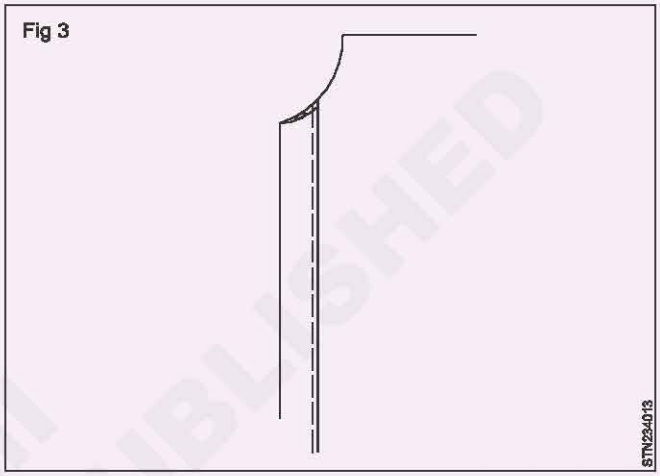



Fig 5

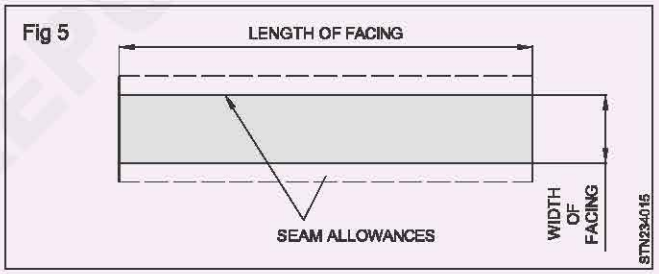



Fig 4

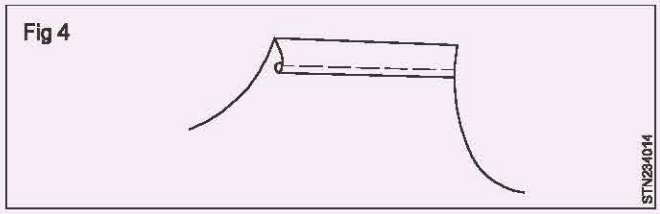
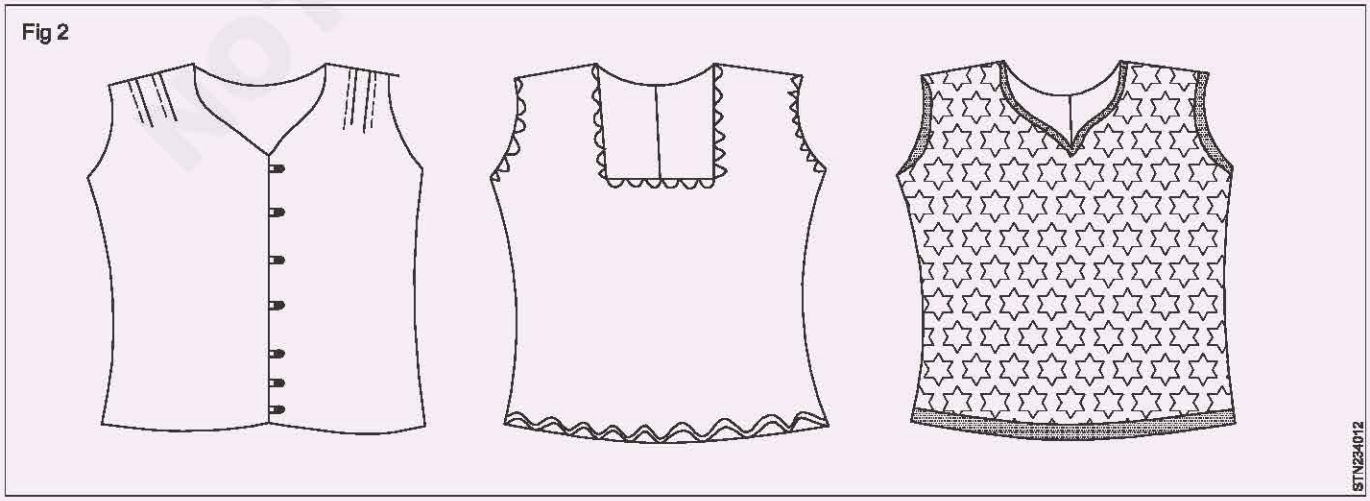



Fig 2

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**Calculation - Facing Material :**

***Example:*** A facing of length 2.80 m is required. The contemplated width of the facing is 5 cm; and extra 2 cm is to be provided for the seams.

The material from which the facing is to be cut has a width of 90 cm. How much material is required?

**Solution**

2.80 m : 0.90 = 3.1 .... (strips) – 4 strips

5 cm + 2 cm = 7 cm

7 cm x 4 = 28 cm.

**Extras for the seams for sewing together the facings are ignored here and in the following exercises.**

**Fasteners:**

Safe fasteners are used in the baby wear – jabala to finish the placket. The placket length is equally divided for fixing fastener. They are of various types, some are decorative and some others are meant to be conspicuous. The common fasteners used in jabala are button loops with shank buttons (only at Front open), Velcro, press studs (at shoulders).

**Care of fabrics:** For washing and drying of garments special care has to be taken. The type of fabric, i.e. the fibre and the finishing require different handling. In most of the cases symbols for washing etc. are given on the sewn–in label.

## Sketch a dress for a toddler

**Objectives:** At the end of this lesson you shall be able to
- **different types of toddler dress**
- **design a suitable dress for toddler.**

**Baby chemise**

Baby chemise is also known as frock petticoat kids inner wear with sleeveless body part and gathered of pleated skirt part, it is usually stitched from thin cotton fabrics of white or light colours. The neckline is cut and stitched deeper and wider as it is worn as and innerwear. The scye depth is kept more than the usual proportion. As no sleeves are attached. The opening is generally kept at the centre back. The neck, scye and bottom are finished with hem, Lace, piping of rill attachment.

**Chemise dress**

A chemise or shift is a classic smock, or a modern type of women's undergarment or dress. Historically, a chemise was a simple garment worn next to the skin to protect clothing from sweat and body oils, the precursor to themodern shirts commonly worn in Western nations.

**Purposes**

Slips serve various purposes. They help a dress or skirt hang properly, especially when static cling might otherwise cause the dress to wrap around the wearer's legs. They protect the skin from chafing against coarse fabrics such as wool; conversely, if the outer garment is made of fine fabric, a slip protects it from perspiration. A slip may be worn for warmth, especially if the dress or skirt is lightweight and thin, whereas in very warm or humid climates, a slip made entirely from cotton may be desired. Slips are often worn to prevent the show through of intimate undergarments such as panties or a brassiere. A slip may also be used to prevent a silhouette of the legs showing through clothing when standing in front of a bright light source.

**Types of slips**

Slips fall into two major categories. A full slip hangs from the shoulders by straps that extend down to the top of the breast area, with a skirt below the bust. Full slips come in a variety of lengths; some extend down to the upper thigh, some to just above the knees, or just below the knees, while others go down to just above the ankles.

A waist slip, "half slip", or "underskirt", is held on to the body around the waist by means of an elastic waistband. The waist slip is also available in the same lengths as the aforementioned full slip. Waist slips that extend down to just above the ankle are often called formal slips, or maxi slips. Mini slips are yet another size option for waist slips. They were first introduced in the 1960s to wear under a mini skirt. American Maid manufactured waist slips that had vents and a rear zipper in addition to the elastic waistband. These slips were made of half nylon and half dacron polyester. As an alternative to the full slip, a waist slip with a matching camisole can be worn to provide full coverage.

There is also similar garment designed to be worn under thin or light-colored slacks, called trouserslips or pettipants. In addition to pants, a pettipant may also be worn under a dress or skirt, and like slips, they are mainly made of nylon or as a layer of luxury, in silk.

**Decorations and fabric**

Many slips have floral lace at the hem, vents or sideslits. Some of the older slips have decorations, such as a butterfly or flowers sewn into the fabric of the slip, and a pillowtab was also added to the waistband of a waist slip.

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The vast majority of modern slips are made entirely of nylon, while others are made from polyester, rayon, acetate, silk or in some cases cotton. Still, there are others made of blends, and the label of the garment might read, for example, "40% nylon, 35% rayon, 25% polyester". Nylon slips are often shiny in appearance, and are very smooth to the touch, while polyester slips can even be more shiny with a real slippery feel, especially charmeuse or "satin" slips. Although charmeuse slips have very attractive eye appeal, they are not as durable as nylon slips, and often tear very easily, especially when wet.

Most of the slips made since the late 20th century are plain and lacking in detail. Intricate decorations and lace designs are almost completely absent from modern-day slips.

**Baby set**

baby set is a type of frock usually worn by babies. Not by girls. It consists of body part, skirt part and sleeves. The garment is featured with yoked bodice. Gathered or smocked skirt and puff sleeves. The neck is generally cut in round or square shape and finished with facing or binding. The opening of the garment is at the centre back, which is fastened with zipper or hooks. Its yoke part is usually prepared with plain fabric and the skirts and sleeves with matching colour printed fabrics. Chintz fabric is most suitable for stitching a baby set.

Short sleeve frocks are a must small baby dress. Traditionally such dresses are cotton wear. However, their dresses are available in a multitude of fabrics, colours, patterns and textures. Such dresses allow easier movement for babies and are quite affordable as well. These dresses are available in such eye-catching designs, and babies look cute as a button in these dresses This dress is worn by girl children of 2 to 4 years age. The upper part of the frock is the yoke and the lower part is the skirt. In the neck desired collar or piping can be stitched. Arm hole part isattached with puff sleeve and it gives a good appearance. Chest part is finished with embroideryor smocking work.

Suitable materials: Soft cotton fabrics, huckobha, fancy materials can be selected.

## Kids wear

**Objectives:** At the end of this lesson you shall be able to
- **to define a umbrella frock**
- **to define a combination suit.**

**Umbrella frock**

Umbrella frock is a traditional eastern wear wide bottom long dress with the umbrella shape. Asian women love to wear it especially pakistani and indian girls there are different types of frocklengths including short, medium long and floor lengths some are bell shape from the bottom and have upper fitting.

Umbrella dress - A flared dress with the skirt portion resembling an umbrella. if you donot get it. Just try twirling in it and you will see the umbrella, well almost suffice to say that thte flare is quite full and alternative.

Its need a 60inch wide cloth to make it or you will get a skirt with a center seam as well as the side seams if youhave a fabric of width lesser than 60 inch ypu will have tojoin fabric pannels to make the 60 inch fabric. you can wear it with leggings as an umbrella kurti or on its own.

**Combination suit**

A combination dress is a set ofupper and lower garments consisting of two or three pieces. A combination dress can be identified by common features in all the components like fabric, design, colour etc. Such a dress gives a formal outlook to the wearer.

The combination dresses described in this lesson refer to western type of combination dresses only.

A very important part in the classical type of formal combination dress is the jacket with lapels. The lapels can point upwards or downwards. This type of jacket normally covers the hip area. It has two - pieces sleeves and two or three fitted pockets.

**Types of kids wear**

Kids are awesome. They are small, they are cute and adorable and they are curious and are always up for something. Their innocence and their ability to see and perceive this world of ours as something new is something that makes us all feel overwhelmed with joy.

Soon these kids start to grow up and from their mother's arms, they soon learn how to walk and start their own journey of life. It is then that they are faced with one of the basic needs of human beings which happens to be clothing. Clothing is what we are going to discuss in this blog about. We are going to talk about the types of kids wear.

Kids are adorable and their little pieces of clothing are also just as cute and adorable as they are, but it is important to know that kids wear is a little different from adult wear because kids skin happens to be very soft and fragile and any material that is harsh might be uncomfortable for the kid and they will be unhappy and cry if they are made to wear that which is why kids wear is generally made from very select blends and soft cotton to make sure that they are soft and loose-fitting that the children do not feel trapped in their clothing.

Having said that now let's see some of the most popular options that are available when it comes to kids wear:

**1 T-shirts**

T-shirts are comfortable and soft, they are not heavy and can be worn baggy also which makes the kids feel comfortable. T-shirts are also stylish and can help make

a baby look dapper and cute at the same time. T-shirts are some of the most common and popular choices of clothes when it comes to babies. Also, t-shirts are unisex which makes them even better as they can be worn by both boys and girls. This makes it easier for parents who are expecting babies to shop for the baby.

**2 Trousers**

Trousers are also a classic choice of clothing when it comes to kids' wear. Casual trousers made of cotton that are comfortable and stretchable are great for kids which is the reason they are made from special blend materials that make them more enjoyable for kids. Trousers are also unisex and can help keep the legs of the kids safe from any wear and tear when they are outside as kids tend to be very energetic and active. A little fall here and it is pretty common for them but it is important that parents always try for their kids to wear covered clothes to protect them from insects and other things as well when outside.

**3 Skirts**

Skirts are the most popular choices when it comes to kids' clothing for girls. They are soft and are comfortable to wear. They also look very cute and adorable and can be worn with a variety of options such as t-shirts or tops.

They are made from cotton or other blend fabrics that make them comfortable yet stylish for the kids. Skirts are not recommended for the boys but if they want to wear them we support their choice regardless of their gender.

**4 Shorts**

When it comes to kids' bottom wear, shorts are the most popular one by far. Even though as we discussed trousers have many benefits when you look at it from the perspective of a parent but no kids want to wear them unless in winter. Kids prefer wearing shorts as they do not come in the way of their movements. They are non-restrictive and let the kids feel and be as free as they want. Shorts are also unisex and can be worn by both boys and girls. They are comfortable and are a great option for summers and evening play.

**5 Denim**

Denims are a very popular choice for kids wear as well. They are a little rough so they are not the best for young they can be worn by kids over the age of 2 years (this is just our recommendation, not a rule). Having said that denims are made of jeans fabric which is extremely tough and stylish and can make the kids look very fashionable and also quite cool. Denims are available as shorts and full trousers and can be worn by both boys and girls equally.

So, these were some of the best-known types of kids wear. If you are looking to get some of the best kids wear in the market made from quality premium materials that are safe for babies and kids with stylish and adorable designs the best choice is UNITO Clothing, one of the top garment manufacturers in India. For more information about our kids' wear collections feel free to check out the website.

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# Gent's Kurta - Style I & II

**Objectives:** At the end of this lesson you shall be able to
- **explain the different features of Kurta**
- **describe the suitable placket type.**

Kurta is a loose faling shirt just above or below knee level. It is worn incombination with pyjama, tight - fitting chudidar or dhotis. It is worn both as everyday wear or as formal dress. A traditional kurta is of rectangular fabric pieces with perhaps as few gusset inserts. The kurta sleeves fall straight to the wrist they do not cuffed but hemmed and machine stitched. The garment is usually stitched with inseam pockets and side slit.

Style variations of Kurta are created with modification of its components like (Fig 1)

- Neckline
- Open
- Gusset

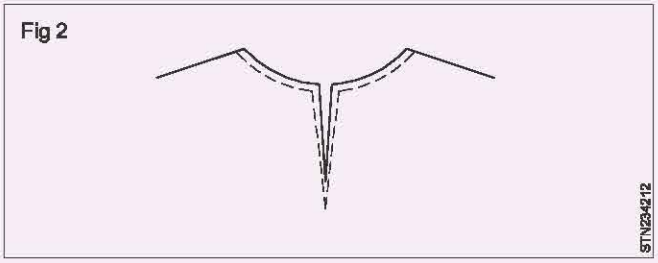
Fig 1

**Neckline:** Normally the Kurta neckline is constructed with bias facing. In certain style, mandarin collar is introduced to give decorative finish to the garment.

**Open**

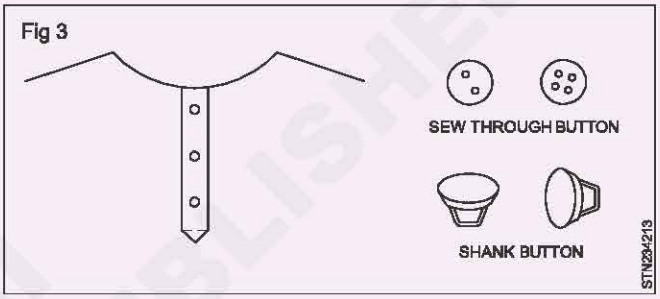
Kurta is stitched with front half open. The open is either constructed as a slit without any fasteners or finished with Kurta placket and button fasteners.

Fig 2




**Kurta placket** the two - piece placket finished with triangular shape at its end is constructed at the center front of the Kurta. The placket is then fastend with either sew buttons or shank buttons. Shank buttons are provided with shank beneath through which it can be fixed. It is often used in Kurtas to give decorative finish. (Fig 3)

Fig 3



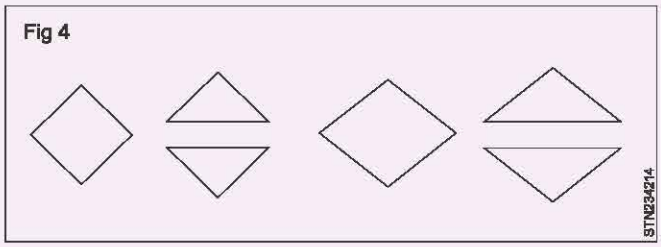

**Gusset** Kalidar Kurta is stitched with gusset pieces to create variation and the to give looseness to the garment. The gusset piece is inserted either on the underarm or were side seam and underarm seam meet. For easier attachment the gusset is stitched to the components before underarm seam and side seam are finished.

A gusset piece is normally of square or diamond shape made of one or two pieces (Fig 4)

**Pocket:** The garment is stitched either with both the patch and inseam pockets or only with inseam pocket.

The style features of Kurta selected for stitching are;

Fig 4




**Kurta - I**

**Nehru Kurta**

- Mandarin collar
- Inseam pocket
- Side slit
- Kurta placket

**Kurta II**

**Kalidar Kurta**

- Kurta placket
- Kali piece attachment
- Inseam pocket

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**Material required for stitching Kurta**

**Nehru Kurta**

2 length +15cm

**Kalidar Kurta**

4 length + 15cm

## Gent's pyjamas - Style 1 & 2

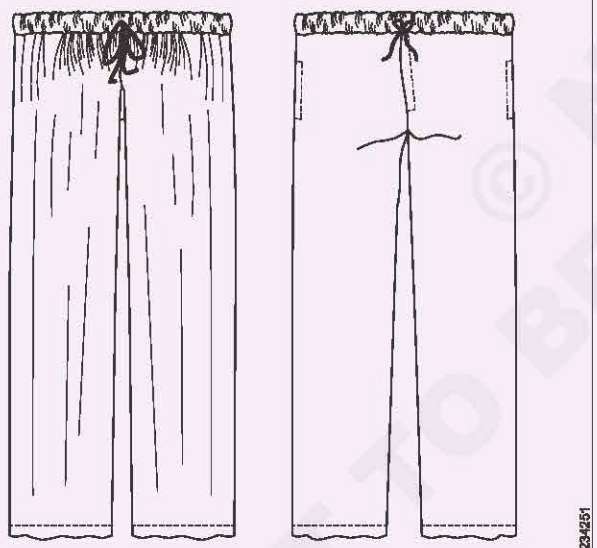
**Objectives:** At the end of this lesson you shall be able to
- **explain the features of pyjama**
- **describe the pyjama waistline finishing methods.**

**Pyjama** also spelled as pyjama are loose, light weight trousers, designed for comfort, using softer materials such as cotton or more luxurious silk or satin. They are used as both indoor or out door garment as well as day and night wear by men now a days. The garment is the simplest form of trousers worn by men.

Style variations of pyjama are created by modifying (Fig 1)

- Length
- Waistline finish
- Pocket
- Crotch line

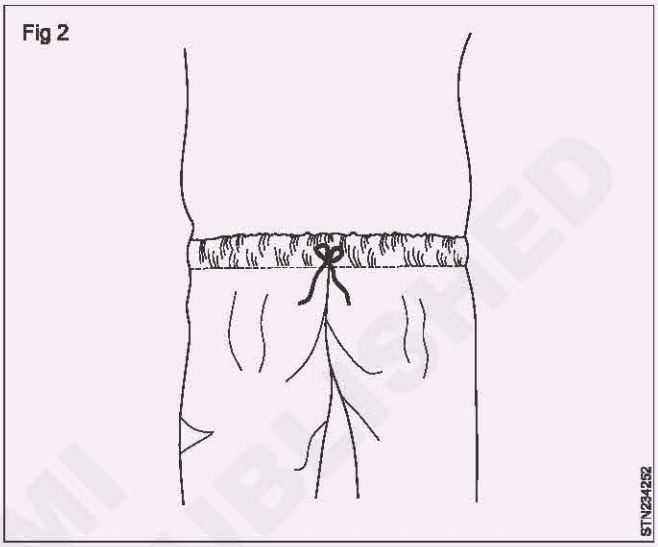
Fig 1




**Length** - Usual length of the garment is measurement from waist to the ankle. To bring variation to the garments, the chudidar pyjama is stistched with gathers below calf level. This pyjama is stitched with extra length than the other pyjama, where as the gather length varies with taste as desired.

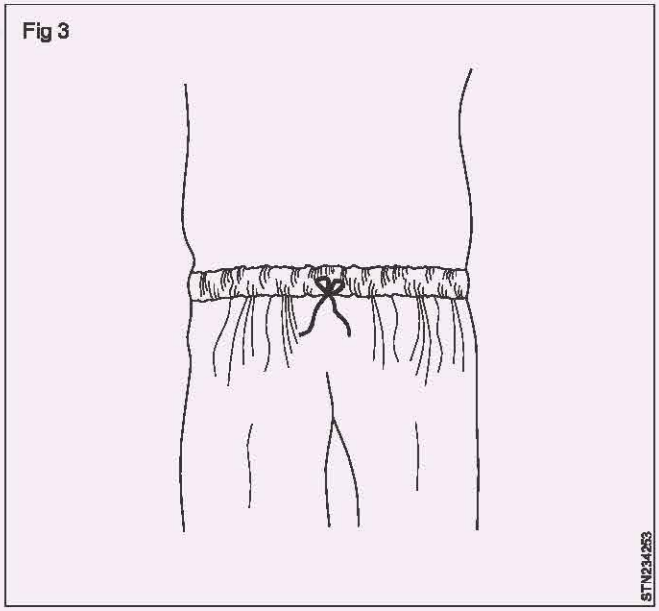
Waistline - The waistline of the pyjama is finished either with the fold down casing or applied casing. **Fold down casing** is used to insert a string / tape. Here a fabric allowance is added to the waistline.It is folded to the wrong side to form a tunnel of a narrow width. A tape, is brought to the right side through a gap in the seam or through button holes that are made in the middle of the casing for fastening. (Fig 2)

Fig 2




**Applied casing** is a seperate strip of fabric attached to the waistline. The width of casing piece should be double the ready width of casing plus seam allowance. It can be of self fabric or contrasting colour fabric as a decorative feature. The tape or elastic is applied in the same way as that of fold down casing. (Fig 3)

Fig 3




**Pocket** the garments is usually prepared without pockets. If required either one inseam pocket on the right side or two pockets on both the sides are introduced . Inseam pockets are always placed in the seam of a garment. Here the pocket piece also hangs on the wrong side of the garments. It is placed at the hip of the pyjama (Fig 4)

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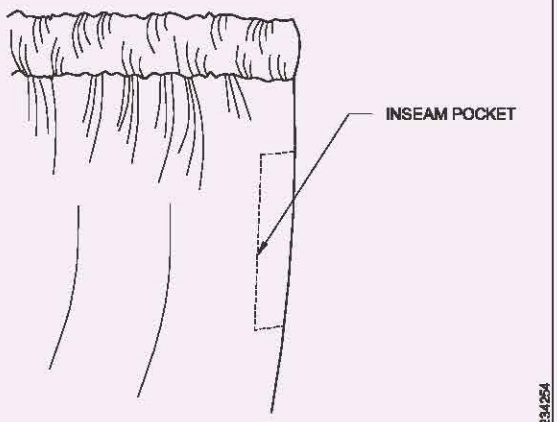
Fig 4



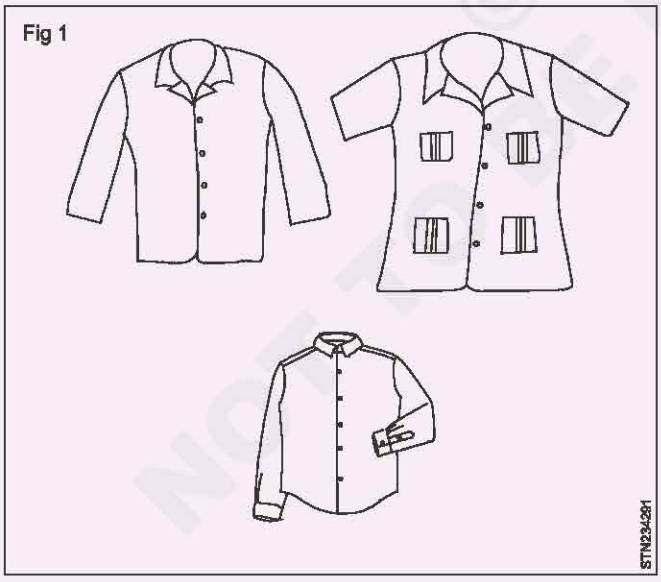

## Gent's shirt - Style I

**Objectives:** At the end of this lesson you shall be able to
- **describe the various types of shirts each with different styles**
- **state the general aspects of fabric grain line directions.**

**Shirt:** Shirt is a loose garment for the upper part of the body which is worn by women and girls together with skirt or trouser sand also by men with shorts and jeans or trouser with different styles according to day to day fashion.

Style variations of shirt are created with modification of its components; (Fig 1)

Fig 1




1 Collar

2 Front placket

3 Yoke

4 Sleeve placket

5 Cuff

Collar - different shirt collars are used in different styles of shirts. A shirt collar with a stand is the most common collar used on gents shirts. this type or collar has two sections, the collar area and the stand area. The collar is first attached to the stand and then the stand to the shirt neckline. This is the collar used on formal shirts. The collar points can be buttoned down or left free. (Fig 2)

Fig 2

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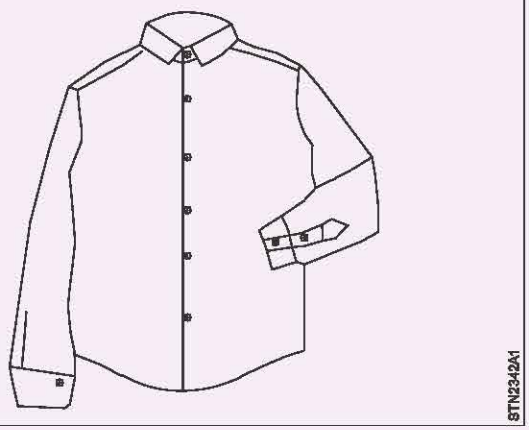
# Gent's shirt - Style II

**Objective:** At the end of this lesson you shall be able to
- **explain different types of shirts.**

### Different types of shirts

Shirt is an important and main garment normally used by gents. Now a days, ladies are also using Shirts. In mass production also, the Shirts where are manufactured by using woven fabric play an important role. The basic style of Gent's Shirt has been illustrated in Fig 1.

Fig 1




In the other important shirt types used in international fashion, Lumberjack Shirt or Logger's Shirt is a heavy, warm, woolen shirt used by both men and women. Formal or Dress is the same style as the man's shirt except that the formal shirt has a wing collar and tucked front and is traditionally white. Western Shirt is of American origin and commonly related to Country and Western music, this shirt was originally worn by cowboys. The 'V' yokes and patch breast pocket are hallmarks, especially when braided and used by both men and women. Garibaldi Shirt or blouse was inspired by the visit to Britain of Giuseppe Garibaldi in 1863 and the famous 'Red shirts' which were worn by his small army. The shirt was made from red wool decorated with black braid and had full sleeves, gathered into a fitted cuff. This is suitable for women as Blouse and men as Shirt. Bowling is a loose fitting shirt with short sleeves and patch breast pocket worn for ten pin bowling and normally having team names embroidered on the back and the pocket and of American origin suitable for both sexes. For the above shirt styles, woven fabrics are used for manufacturing.

Knitted fabrics are also used to construct the shirts. 'T' Shirt is a classic cult pull-on top, the tee shirt is made in fine jersey fabric with a knitted rib, crew neckline and is derived from underwear. This is suitable for both men and women. Polo Shirt is a knitted cotton fabric pull-on shirt with a ribbed collar and cuffs. There is often a stripe running through the collar and cuffs and a short button placket suitable for both sexes. Rugby shirt is a sports men's shirt with a knitted collar long sleeves with knitted cuffs. The hallmark of the Rugby shirt is the brightly colored striped running horizontally across the body.

Cardigan is a knitted garment with ribbing trims and a button through front fastening used by both men and women. Cut and sew sweat shirt is a men's wear and 'Cut and sew' is the description of the method of making a garment from knit fabric.

Fig 2

The garment pieces are cut out from knit fabric which is laid out as if it was a woven fabric, with pattern pieces placed upon it, and then sewn together as normal. Different stitches and finishes have to be used to maintain the natural stretch of the fabric.

A shirt is a cloth garment for the upper body (from the neck to the waist).

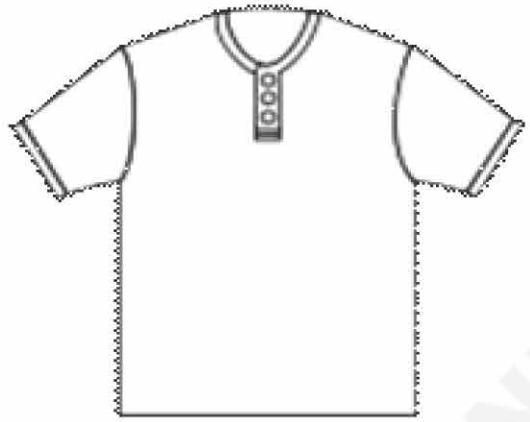
Originally an undergarment worn exclusively by men, it has become, in American English, a catch-all term for a broad variety of upper-body garments and undergarments. In British English, a shirt is more specifically a garment with a collar, sleeves with cuffs, and a full vertical opening with buttons or snaps (North Americans would call that a "dress shirt", a specific type of collared shirt). A shirt can also be worn with a necktie under the shirt collar.

Three types of shirt

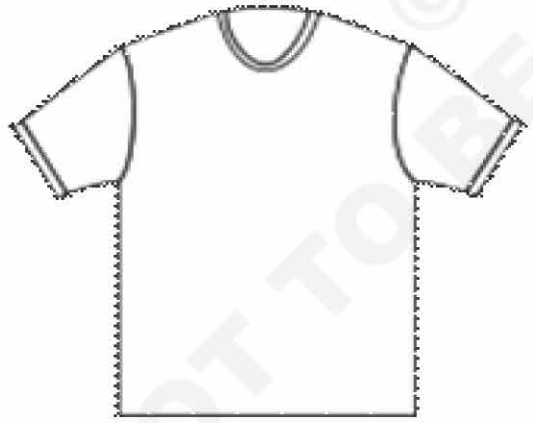
- Camp shirt – a loose, straight-cut, short sleeved shirt or blouse with a simple placket front-opening and a "camp collar".
- Dress shirt – shirt with a formal (somewhat stiff) collar, a full-length opening at the front from the collar to the hem (usually buttoned), and sleeves with cuffs
- White shirt – usually dress shirt which its colour is white
- Dinner shirt – a shirt specifically made to be worn with male evening wear, e.g. a black tie or white tie.

Fig 3

Polo shirt



Henley shirt



T-shirt

- Guayabera – an embroidered dress shirt with four pockets.
- Poet shirt – a loose-fitting shirt or blouse with full bishop sleeves, usually with large frills on the front and on the cuffs.
- T-shirt – also "tee shirt", a casual shirt without a collar or buttons, made of a stretchy, finely knit fabric, usually cotton, and usually short-sleeved. Originally worn under other shirts, it is now a common shirt for everyday wear in some countries.[14]
    - Long-sleeved T-shirt – a T-shirt with long sleeves that extend to cover the arms.
    - Ringer T-shirt – tee with a separate piece of fabric sewn on as the collar and sleeve hems
    - Halfshirt – a high-hemmed T-shirt
    - Sleeveless shirt – a shirt manufactured without sleeves, or one whose sleeves have been cut off, also called a tank top
- A-shirt or vest or singlet (in British English) – essentially a sleeveless shirt with large armholes and a large neck hole, often worn by labourers or athletes for increased movability.
- Camisole – woman's undershirt with narrow straps, or a similar garment worn alone (often with bra). Also referred to as a cami, shelf top, spaghetti straps or strappy top
- Polo shirt (also tennis shirt or golf shirt) – a pullover soft collar short-sleeved shirt with an abbreviated button placket at the neck and a longer back than front (the "tennis tail").
    - Rugby shirt – a long-sleeved polo shirt, traditionally of rugged construction in thick cotton or wool, but often softer today
    - Henley shirt – a collarless polo shirt
- Baseball shirt (jersey) – usually distinguished by a three-quarters sleeve, team insignia, and flat waist seam
- Sweatshirt – long-sleeved athletic shirt of heavier material, with or without hood
- Tunic – primitive shirt, distinguished by two-piece construction. Initially a men's garment, is normally seen in modern times being worn by women
- Shirtwaist – historically (circa. 1890–1920) a woman's tailored shirt (also called a "tailored waist") cut like a man's dress shirt;[15] in contemporary usage, a woman's dress cut like a men's dress shirt to the waist, then extended into dress length at the bottom
- Nightshirt – often oversized, ruined or inexpensive light cloth undergarment shirt for sleeping.
- Halter top – a shoulderless, sleeveless garment for women. It is mechanically analogous to an apron with a string around the back of the neck and across the lower back holding it in place.
- Top shirt – a long-sleeved collarless polo shirt
- Heavy shirt – a shirt with the heavy size that covers up under the neck
- Onesie or diaper shirt – a shirt for infants which includes a long back that is wrapped between the legs and buttoned to the front of the shirt
- Tube top (in American English) or boob tube (in British English) – a shoulderless, sleeveless "tube" that wraps the torso not reaching higher than the armpit,

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staying in place by elasticity or by a single strap that is attached to the front of the tube

- Punishment shirts were special shirts made for the condemned, either those cursed supernaturally,

## Parts of shirt

Many terms are used to describe and differentiate types of shirts (and upper-body garments in general) and their construction. The smallest differences may have significance to a cultural or occupational group. Recently, (late twentieth century, into the twenty-first century) it has become common to use tops as a form of advertisement. Many of these distinctions apply to other upper-body garments, such as coats and sweaters.

**Shoulders and arms**

**Sleeves**

**Main article:** Sleeves

**Shirts may:**

- have no covering of the shoulders or arms – a tube top (not reaching higher than the armpits, staying in place by elasticity)
- have only shoulder straps, such as spaghetti straps
- cover the shoulders, but without sleeves
- have shoulderless sleeves, short or long, with or without shoulder straps, that expose the shoulders, but cover the rest of the arm from the biceps and triceps down to at least the elbow
- have short sleeves, varying from cap sleeves (covering only the shoulder and not extending below the armpit) to half sleeves (elbow length), with some having quarter-length sleeves (reaching to a point that covers half of the biceps and triceps area)
- have three-quarter-length sleeves (reaching to a point between the elbow and the wrist)
- have long sleeves (reaching a point to the wrist to a little beyond wrist)

**Cuffs**

Cuff

Shirts with long sleeves may further be distinguished by the cuffs:

- no buttons – a closed placket cuff
- buttons (or analogous fasteners such as snaps) – single or multiple. A single button or pair aligned parallel with the cuff hem is considered a button cuff. Multiple buttons aligned perpendicular to the cuff hem, or parallel to the placket constitute a barrel cuff.
- buttonholes designed for cufflinks
- a French cuff, where the end half of the cuff is folded over the cuff itself and fastened with a cufflink. This type of cuff has four buttons and a short placket.
- more formally, a link cuff – fastened like a French cuff, except is not folded over, but instead hemmed, at the edge of the sleeve.
- asymmetrical designs, such as one-shoulder, one-sleeve or with sleeves of different lengths.

**Lower hem**

- hanging to the waist
- leaving the belly button area bare (much more common for women than for men). See halfshirt.
- covering the crotch
- covering part of the legs (essentially this is a dress; however, a piece of clothing is perceived either as a shirt (worn with trousers) or as a dress (in Western culture mainly worn by women)).
- going to the floor (as a pajama shirt)

**Body**

- vertical opening on the front side, all the way down, with buttons or zipper. When fastened with buttons, this opening is often called the placket front.
- similar opening, but in back.
- left and right front side not separable, put on over the head; with regard to upper front side opening:
  - V-shaped permanent opening on the top of the front side
  - no opening at the upper front side
  - vertical opening on the upper front side with buttons or zipper
  - men's shirts are often buttoned on the right whereas women's are often buttoned on the left.

**Neck**

- with polo-neck
- with "scoop" neck
- with v-neck but no collar
- with plunging neck
- with open or tassel neck
- with collar
  - windsor collar or spread collar – a dressier collar designed with a wide distance between points (the spread) to accommodate the windsor knot tie. The standard business collar.
  - tab collar – a collar with two small fabric tabs that fasten together behind a tie to maintain collar spread.

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- wing collar – best suited for the bow tie, often only worn for very formal occasions.
- straight collar – or point collar, a version of the windsor collar that is distinguished by a narrower spread to better accommodate the four-in-hand knot, pratt knot, and the half-windsor knot. A moderate dress collar.
- button-down collar – A collar with buttons that fasten the points or tips to a shirt. The most casual of collars worn with a tie.
- band collar – essentially the lower part of a normal collar, first used as the original collar to which a separate collarpiece was attached. Rarely seen in modern fashion. Also casual.
- turtle neck collar – A collar that covers most of the throat.
- without collar
- V-neck no collar – The neckline protrudes down the chest and to a point, creating a "V"-looking neckline.

**Other features**

- pockets – how many (if any), where, and with regard to closure: not closable, just a flap, or with a button or zipper.
- with or without hood

Some combinations are not applicable, e.g. a tube top cannot have a collar.

## Measures and sizes

The main measures for a jacket are:
- Shoulders
- Bust
- Waist
- Hip
- Sleeve
- Length, from the neck to the waist or hip.

## Types of fabric

There are two main categories of fibres used: natural fibre and man-made fibre (synthetics or petroleum based). Some natural fibres are linen, the first used historically, hemp, cotton, the most used, ramie, wool, silk and more recently bamboo or soya. Some synthetic fibres are polyester, tencel, viscose, etc. Polyester mixed with cotton (poly-cotton) is often used. Fabrics for shirts are called shirtings. The four main weaves for shirtings are plain weave, oxford, twill and satin. Broadcloth, poplin and end-on-end are variations of the plain weave. After weaving, finishing can be applied to the fabric.

## Gent's trousers - Style I

**Objectives:** At the end of this lesson you shall be able to
**• describe the various types of shirts each with different styles**
**• state the general aspects of fabric grain line directions.**

**Trousers** also known as parts the common gents wear. It is worn at the lower part of the body from waist to ankle, covering both legs separately. Trouser is a bifurcated garment (i-e) a garment which is divided into two parts, right and left. The trousers are either stitched with flat fell seam are raw edges are finished with overlock stitches to prevent it from fraying jeans trousers are stitched out of denim fabric, which is durable woven cotton twill, originally with an indigo dyed warp and white welt. The jeans are always stitched with decorative top stitches and fastened with metal fasteners.

**Pant derivatives:** Pant derivatives is a term used to describe the length of a pant whenever its original hemline is raised or lowered.

Pant length variations can be applied using any of the foundations; however the slack and jeans are most commonly used for developing derivates. It must be kept in mind that while developing fitted pedal pusher, toreador and capri lengths an opening should be provided at the side seam at hem for ease of foot entry. Below are common pant lengths with their style names.

- Shorty/shorts: 4.5 cm below crotch at inseam ending 2.5 cm to 4.5 cm above crotch level at side seam
- Shorts: 5 cm below crotch level
- Jamaica: midway between crotch and knee
- Bermudas: between Jamaica and knee
- Pedal pusher: 5 cm down from knee
- Toreador: between knee and ankle
- Capri: 2.5 cm above ankle.

Style variations of trousers are created with

1 Waist band

2 Fly

3 Pocket

4 Seam Refer shorts theory for these variations in trousers

5 Shape - variations in trousers are created with its different shapes

Fig 1

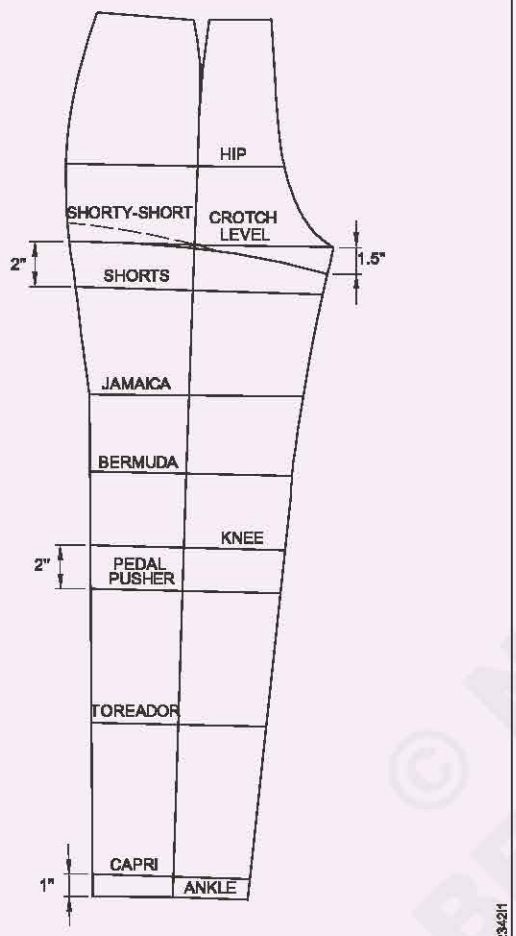
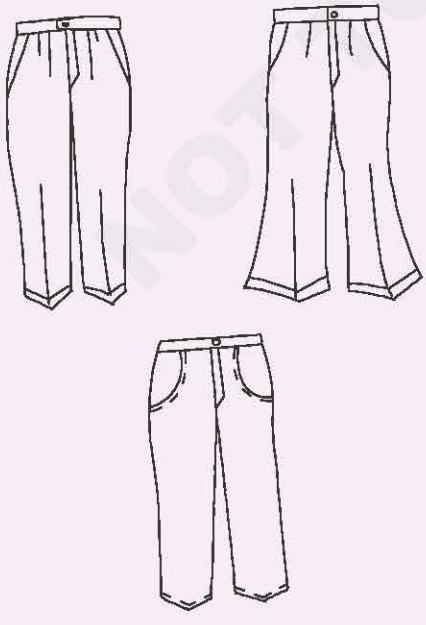


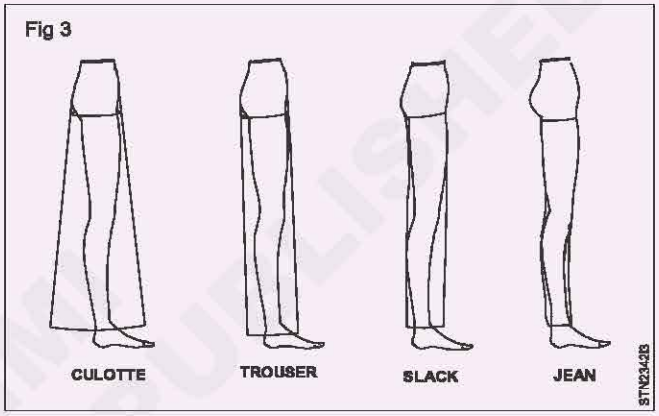

Fig 2




Analysis of trousers foundation: A trousers is divided as its foundation (the part above crotch level) and its legline (the part below crotch level). The foundation of a trouser covers the area from waist to crotch. The portion of the trouser covers the inside part of the leg is crotch extension. The length of the crotch extension controls the trouser foundation. The longer the crotch extension, the looser the fit around the crotch level. The shorter the crotch extension, the closer the fit. There are four major trouser. The foundations are characterized by the special way in which each fits the abdomen and buttocks.

- Culotte hangs away from abdomen and buttocks.
- Trouser hangs straight from abdomen and buttocks.
- Slack cups slightly under abdomen and buttocks.
- Jean contours abdomen and buttocks. (Fig 3)

Fig 3




Style features of trousers selected for stitching are

**Trousers I**

**Pleated trousers**

- pleated front part
- dart at back
- inseam pocket
- hip pocket
- zip fly
- two - piece waistband

**Trousers - II**

**Bell bottom trousers**

- Hip pocket
- Slant pocket
- Back dart
- Zip bottoms

**Trousers III**

**Jeans**

- Shaped front hip pocket
- Patch pocket at back
- Elastic at back part waistline
- Shaped back yoke.

**Material required for stitching trousers**

Single width ---------- 2 length + 20 cm

Double width ---------- 1 length + 15 cm

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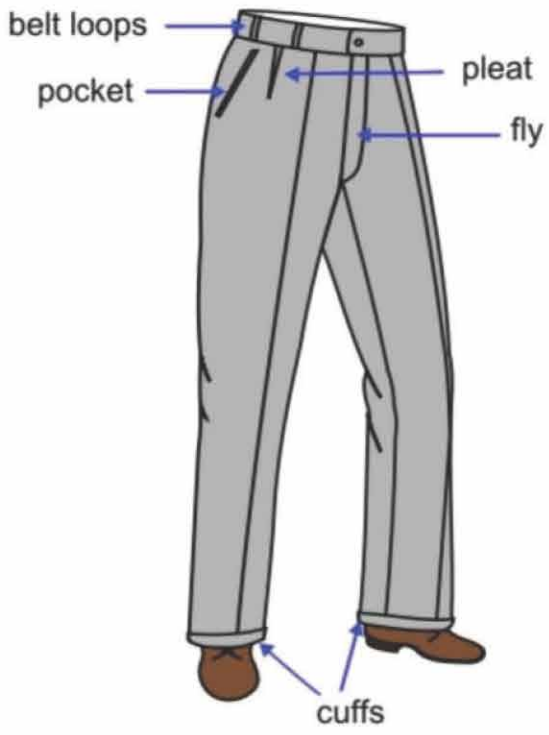
**Parts of trousers**

Fig 4




**Pleats**

Pleats just below the waistband on the front typify many styles of formal and casual trousers, including suit trousers and khakis. There may be one, two, three, or no pleats, which may face either direction. When the pleats open towards the pockets they are called reverse pleats (typical of most trousers today) and when they open toward the fly they are known as forward pleats.

**Cuffs**

Trouser-makers can finish the legs by hemming the bottom to prevent fraying.[citation needed] Trousers with turn-ups (cuffs in American English), after hemming, are rolled outward and sometimes pressed or stitched into place.

**Fly**

A fly is a covering over an opening join concealing the mechanism, such as a zipper, velcro or buttons, used to join the opening. In trousers, this is most commonly an opening covering the groin, which makes the pants easier to put on or take off.

Trousers have varied historically in whether or not they have a fly. Originally, hose did not cover the area between the legs. This was instead covered by a doublet or by a codpiece. When breeches were worn, during the Regency period for example, they were fall-fronted (or broad fall). Later, after trousers (pantaloons) were invented, the fly-front (split fall) emerged.[64] The panelled front returned as a sporting option, such as in riding breeches, but is now hardly ever used, a fly being by far the most common fastening. Most flies now use a zipper, though button-fly pants continue to be available.

**Trouser support**

At present, most trousers are held up through the assistance of a belt which is passed through the belt loops on the waistband of the trousers. However, this was traditionally a style acceptable only for casual trousers and work trousers; suit trousers and formal trousers were suspended by the use of braces (suspenders in American English) attached to buttons located on the interior or exterior of the waistband. Today, this remains the preferred method of trouser support amongst adherents of classical British tailoring. Many men claim this method is more effective and more comfortable because it requires no cinching of the waist or periodic adjustment.

**Types**

There are several different main types of pants and trousers, such as dress pants, jeans, khakis, chinos, leggings, and sweatpants. They can also be classified by fit, fabric, and other features. There is apparently no universal, overarching classification.

Capri pants (also known as three quarter legs, capris, crop pants, man-pris, clam-diggers, [1] flood pants, jams, highwaters, or toreador pants[2]) are pants that are longer than shorts but are not as long as trousers. Capri pants can be a generic term for any cropped slim pants, and also used as a specific term to refer to pants that end on the ankle bone.

Oxford bags were a loose-fitting baggy form of trousers favoured by members of the University of Oxford, especially undergraduates, in England during the early 20th century from the mid-1920s to around the 1950s. The style had a more general influence outside the University, including in America, but has been somewhat out of fashion since then.

Low-rise pants, also known as "low-cut jeans", "lowriders" or "rap pants", are a type of pants that sit low on, or below, the hips, usually at least 8 centimeters (3 inches) lower than the navel. Low-rise pants have been available since the 1990s, in styles for both men and women, with popularity increasing in the 2000s.

A pantsuit or pant suit, also known as a trouser suit outside the United States, is a woman's suit of clothing consisting of pants and a matching or coordinating coat or jacket.

Formerly, the prevailing fashion for women included some form of a coat, paired with a skirt or dress—hence the name pantsuit.

Thai fisherman pants are lightweight unisex trousers that are made wide in the waist so that one size fits all. The pants are wrapped around the waist and ribbons are tied to form a belt. Excess material is then folded over the knot.

# Gent's trousers - Style II

**Objective:** At the end of this lesson you shall be able to
- **explain different types of pants.**

### Different types of pants

Gaucho pants are uniform trousers of the Argentinean cowboy, adapted by women, quite wide in the leg. Culottes is a garment has the appearance of a skirt. Normally described as a divided skirt it was devised in the 1930s before shorts were acceptable for women. Bloomers is a full trouser meant for women, gathered in above the ankles and at the waist, named from the American reformer, Amelia Jenks Bloomer. Capri is a women's trouser that finishes at mid calf level and is quite fitted, made in a woven fabric. Trouser Skirt is a normal women's trouser with a second, top layer forming a skirt effect. Leggings is a body hugging women's trouser always made in a stretch fabric to get the desired fit, this may be a jersey or a Lycra content fabric. Leggings can be worn with tunics, baggy tops or short dresses. Harem Pant or Balloon Pant is a full women's trouser on a shaped waistband. The full leg is controlled at the hem by elastication. The harem is usually made in a supple silk fabric.

The jeans is a classic cult garment with fly front fasten, top-stitching, back yoke detailing and belt loops, traditionally indigo blue and made from cotton. Originally used for work wear, nowadays the jean can be many colours but the fabric is easily recognizable by the white yarn weft and coloured warp. It is a hard wearing fabric that can be treated to look 'worn' 'distressed', 'stone washed' or 'snow washed', or it can simply by allowed to fade naturally after washing. Now a days, both sexes are using Jeans. Jodhpurs are a type of riding breeches originating from India, baggy to the knees and tight fitting from knee to ankle with reinforcement patches for rigorous wear and suitable for both men and women. Bell Bottoms are used by both sexes. Originally worn by sailors, these 1960s trousers were not as wide and flared from the mid-calf. Oxford bags trousers were worn by English men from 1920s and had very wide flared bottoms up to twenty four inches. Now women are also using this.

Trousers, slacks, or pants are an item of clothing that might have originated in Central Asia, worn from the waist to the ankles, covering both legs separately (rather than with cloth extending across both legs as in robes, skirts, and dresses).

In the United Kingdom, the word pants generally means underwear and not trousers.[1] Shorts are similar to trousers, but with legs that come down only to around the area of the knee, higher or lower depending on the style of the garment. To distinguish them from shorts, trousers may be called "long trousers" in certain contexts such as school uniform, where tailored shorts may be called "short trousers" in the UK.

The oldest known trousers were found at the Yanghai cemetery in Turpan, Sinkiang (Tocharia), in present-day western China, it's been dated to the period between the 10th and the 13th centuries BC. Made of wool, the trousers had straight legs and wide crotches and were likely made for horseback riding.

In most of Europe, trousers have been worn since ancient times and throughout the Medieval period, becoming the most common form of lower-body clothing for adult males in the modern world. Breeches were worn instead of trousers in early modern Europe by some men in higher classes of society. Distinctive formal trousers are traditionally worn with formal and semi-formal day attire. Since the mid-20th century, trousers have increasingly been worn by women as well.

Jeans, made of denim, are a form of trousers for casual wear widely worn all over the world by both sexes. Shorts are often preferred in hot weather or for some sports and also often by children and adolescents. Trousers are worn on the hips or waist and are often held up by buttons, elastic, a belt or suspenders (braces). Unless elastic, and especially for men, trousers usually provide a zippered or buttoned fly. Jeans usually feature side and rear pockets with pocket openings placed slightly below the waist band. It is also possible for trousers to provide cargo pockets further down the legs.

Maintenance of fit is more challenging for trousers than for some other garments. Leg-length can be adjusted with a hem, which helps to retain fit during the adolescent and early adulthood growth years. Tailoring adjustment of girth to accommodate weight gain or weight loss is relatively limited, and otherwise serviceable trousers may need to be replaced after a significant change in body composition. Higher quality trousers often have extra fabric included in the centre-back seam allowance, so the waist can be let out further.

# Methods of removing different kinds of stains

**Objectives:** At the end of this lesson you shall be able to
- **international label system**
- **new development**
- **fabric perforaneanse code.**

## Introduction

A care label is a tag that is attached to textile or clothing products, which show instructions for proper care of the product. Different countries follow different care labelling systems. While certain care labelling systems are mandatory as required by national regulations, some others are adopted on a voluntary basis. These guidelines are in the form of symbols, which were developed by the international Association for Textile Care Labelling (GINETEX)

**The system consists of five basic symbols and their full descriptions are as follows**

**The International Care Labelling System**

Fig 1

**WASHING**

Fig 2

Maximum temperature 95° C
Mechanical action normal
Rinsing normal
Spinning normal

Maximum temperature 95°C
Mechanical action reduced
Rinsing at gradually decreasing temperature (cool down)
Spinning reduced

Maximum temperature 70°C
Mechanical action normal
Rinsing normal
Spinning normal

Maximum temperature 60°C
Mechanical action normal
Rinsing normal
Spinning normal

Maximum temperature 60°C
Mechanical action reduced
Rinsing at gradually decreasing temperature (cool down)
Spinning reduced

Maximum temperature 50°C
Mechanical action reduced
Rinsing at gradually decreasing temperature (cool down)
Spinning reduced.

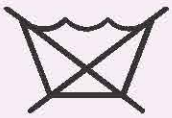
Maximum temperature 40°C
Mechanical action normal
Rinsing normal
Spinning normal

Maximum temperature 4°C
Mechanical action reduced
Rinsing at gradually decreasing temperature (cool down)
Spinning reduced

Maximum temperature 40°C
Mechanical action much reduced
Rinsing normal
Spinning normal
Do not wring by hand

Maximum temperature 30°C
Mechanical action much reduced
Rinsing normal
Spinning reduced

Hand wash only
Do not machine wash
Maximum temperature 40°C
Handle with care.



Do not wash
Be cautious when treating in wet stage

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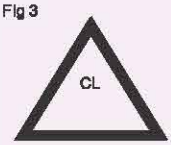
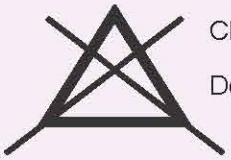
**Bleaching**

Fig 3




Only cold and dilute solution



Chlorine based bleaching allowed

Do not use chlorine based bleach

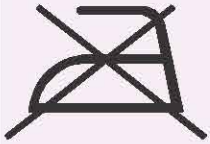
**Ironing**

Fig 4

Iron at a maximum sole - plate temperature

Iron at a maximum sole - place temperature of 150°C

Iron at a maximum sole - plate of 200°C temperature of 110°C



Do not iron Steaming and steam treatments are not allowed

**Dry - Cleaning**

Fig 5

Dry cleaning in all solvents normally used for dry -cleaning this includes all solvents listed for the symbol P, plus trichloroethylene and 1,1,1-trichloroethane

Dry - cleaning in tetra chloroethylene, mono fluoric chloromethane and all solvents listed for the symbol F. Normal cleansing. procedures without restrictions.

Dry - cleaning in the solvents listed in the previous paragraph. Strict limitations on the addition of water and / or mechanical action and / or temperature during cleaning and / or drying. No self - service cleaning allowed.

Dry - cleaning intro fluorotri chloroethane, white spirit (distillation temperature between 150°C and 21°C, flash point 380 C to 600C). Normal cleansing procedures without restrictions.

Dry - cleaning in the solvents listed in the previous paragraph. Strict limitations on the addition of water and / or mechanical action and/or temperature during cleaning and/or drying. No self service cleaning allowed.

Do not dry - clean

No stain removal with solvents

**Drying**

Fig 6

Tumble dry possible
Normal drying cycle

Tumble dry possible

Drying at lower temperature setting

Do not tumble dry

**The Japanese care labelling system**

The Japanese care labelling system has symbols grouped in six categories : washing, possibilities of chlorine - based bleaching, ironing, dry - cleaning, wringing and drying. Based on JISL 0217 (1995), the following show the full description of the symbols :

**Washing (with water)**

Fig 1

Machine - washable in maximum water temperature of 95°C

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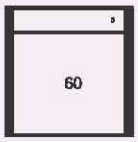
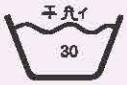



Machine - washable in maximum water temperature of 60°C

Machine - washable in maximum water temperature of 40°C

Machine - washable at slow water current or gentle hand wash in maximum water temperature of 40°C

Machine - washable at slow water current or gentle hand wash in maximum water temperature of 30°C



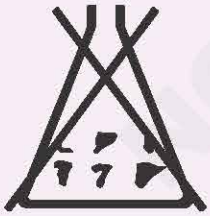

Should be washed gently by hand (not machine washable)

Cannot be washed with water

## Bleaching

Fig 2

Chlorine - based bleaching allowed



Do not use chlorine - based bleach

## Ironing

Fig 3

Should be ironed at a temperature between 180° -210°C

Should be ironed at a temperature between 140° - 160°C

Should be ironed at a temperature between 80° - 120°C

Cannot be ironed

May be ironed at 1800C - 2100 if a cloth is placed between iron and garment

## Dry-cleaning

Fig 4

Can be dry - cleaned. Use solvent of perchloroethylene or of petroleum - based solvent.

Can be dry - cleaned. Use only a petroleum - based solvent.

Cannot be dry - cleaned

## Wringing

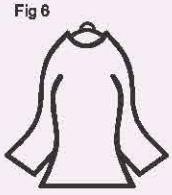
Fig 5

Wring gently by hand or for a short time by centrifugal hydroextractor

Cannot be wrung

## Drying

Fig 6



Hang dry

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Hand dry in shade

Lay flat to dry in shade

Lay flat to dry

**Labelling method**

1 Symbols should be arranged from left to right according to the following sequence

2 For coloured products, which are not usually bleached, the symbols for possibility of chlorine bleached may be omitted

3 For products, which are not usually ironed, the symbols for ironing may be omitted (Except cannot be ironed)

4 For products, which can be washed with water, symbols for dry - cleaning may be omitted (Except cannot be dry -cleaned)

5 The symbols should be either in black or dark blue whereas the prohibition symbols are in red and a on a white ground.

Fig 7

STN244427

**The canadian care labelling system**

This system consists of five basic symbols which are illustrated in three traffic light colours, with green colour indicating no special precautions, a red colour indicates prohibition and orange colour suggests that precautions are necessary.

Words in English and French may be used, in addition to the symbols conveying special instructions not converted by one of the basic symbols. The five symbols must appear in the following order on the care labels : washing, bleaching, drying, ironing, and dry - cleaning. The following table shows the symbols described in CAN / CGSB.

Fig 1

STN2444431

**Washing**

Fig 2

Machine wash in hot water at a normal setting

Machine wash in warm water at a normal setting

Machine wash in warm water at a gentle setting (reduced agitation)

Machine wash in lukewarm water at a gentle setting (reduced agitation)

Machine wash in cool water at a gentle setting (reduced agitation)

Hand wash in cool water

Do not wash

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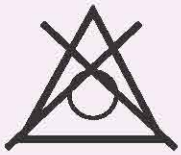
**Chlorine bleaching**

Fig 3

Use chlorine bleach with care



Do not use chlorine bleach

**Drying**

Tumble dry at medium ti high temperature

Tumble dry at low temperature

Hang to dry

Drip dry

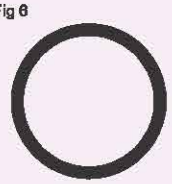
Dry flat

**Ironing**

Fig 5

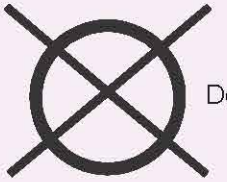
**Dry-cleaning**

Fig 6



Dry - clean

Dry - clean with caution



Do not dry-clean

**The European Care Labelling System**

In order to unite the existing standards, individual committees of European Union are reviewing the standards. In the recent renumbering process of BS Standard, BS EN 23758 : 1994 (care labelling code using symbols), published by the European Committee for Standardization (CEN), is identical with ISO 3758: 191, published by The International. Organization for Standardization (ISO), for labelling textile materials.

A correct care label for European countries is now required to consist at least four and sometimes five symbols in the following sequence is given below. The washing process, bleaching process, ironing process, dry cleaning and drying process are similar to the International Care Labelling System.

Fig 1

**The American Care Labelling System**

According to the Federal Trade Commission's Care Labelling Rule that has been in effect since 1972, word - based system id used to the U.S. apparel. The care label is composed of care instruction, appropriate temperature settings and warnings. The care label is generally listed in the sequence as follows :

1 Machine wash/Hand wash/Dry-clean.

2 Washing temperature.(hot/warm/cold)

3 Washing machine program.(delicate/permanent press/normal cycle)

4 Bleaching instruction.(do not bleach/non -chlorine bleach/chlorine bleach)

5 Drying method.(tumble dry/line dry/flat dry/drip dry)

6 Ironing. (do not iron/cool iron/warm iron/hot iron)

7 Warning wordings.(wash separately, not wring etc)

Besides the informative wordings of the care label, manufacturers and importers must provide labels that:

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- Are fastened so they can be seen or easily found by consumers at the point of sale.
- If not seen or easily found at the point of sale, it will be supplemented by care information that also appears on the outside of the package or on a hang tag fastened to the product.
- Remain fastened and legible during the useful life of the product.
- Say what regular care is needed for the ordinary use of the product.

**New Development**

In December 1996, the Federal Trade Commission approved the use of the label system. The new label system gives companies the option to use symbols on care label instead of written instructions.

Starting from July 1, 1997, manufacturers are using care symbols developed by the American Society for Testing and Materials (ASTM) in place of words on permanent labels.

Below are the new developed care symbols:

**The Fabric Performance Codes**

Premiere Vision informs buyers and visitors about the added-value of fabrics presented at the Salon, especially when these characteristics or performance features are invisible. Established a year ago, the 'performance codes' use various pictograms to convey a fabric's properties or specific qualities, whether visible or not. The intial series of pictograms edited by Premiere Vision for the exclusive use of weaves exhibitors, is joined this season by 2 new performance codes.

**Reflecting:** property of a cloth that reflects light. This term includes fluroscent, phosphorescents and retroreflexive.

**Anti - UV :** function added to a fabric via a special treatment of the fibre and blocking the UV rays that are dangerous to the skin with a protection factor of 30 average.

**Antibacterial :** chemical process applied to a cloth to stop the development of bacteria caused by but perspiration.

**Climatic :** property of a fabric that controls the temperature of the fibre in order to protect the body from exterior climatic conditions be they hot or cold.

**Thermal :** property of a cloth which regulates the temperature of a fibre in order to retain a dry and warm micro climate between skin and garment - in order to avoid body chill.

**Membrane :** very thin synthetic film, bonded onto a fabric, either freely inserted or laminated, a give it water and wind proofing - whilst retaining breathability.

**Coating :** finishing process, which deposits a specific product on the surface of a fabric to give it special qualities.

**Double - Face :** Cloth presenting two different sides each with its specific function.

**Multi-Layer :** Cloth obtained by a bonding process of two or more materials - each with its distinct properties.

**Water-repellent :** finishing process which enables a fabric to resist penetration by water in its liquid form, by oil or dirt. Liquids run off the fabric without penetrating it.

**Waterproof :** property of a fabric, which stops water going through.

**Breathable waterproof :** property of a fabric which stops liquid water going through allows perspiration to exit.

**Easy - care :** property of a fabric aimed a easing its domstic use

**Mono -stretch :** A fabric that stretch in the warp or the weft, and which regains is initial dimensions after stretching .This property is obtained through the use of elastance, textured yarns, or yarns of an elastic nature.

**Bi - stretch :** A fabric that stretches in the warp and the weft and which regains its initial dimnsions after stretching. This property is obtained through the use of elastance, textured yarns, or yarns of elasticnature.

**Polar-fleece:** type of double-knit boucle, knit intensely raised on one face or on both, producing a fleece effect.

**Knit :** fabric produced manually or on a knitting machine, by the interlacing of loops made up of one or more yarns.

**Weave :** fabric produced on a weaving by the criss - crossing of two groups of yarns (warp and weft)

# Stains and its treatments

**Objectives :** At the end of this lesson you shall be able to

- **explain the different kinds of stain**
- **explain its cleaning agents.**

It is always practical that the stains should not be allowed to set, and should be removed as they are fresh. It will be easier to remove stains by recognising them. For this purpose we shall make a classification of stain.

We shall learn about some more stain other than classified stains, and discuss about various method of removal of stains. Before applying any method for removal of any stains, some of the facts must be kept in mind. Now methods of removing each type of stains are given here. For some stains two or three methods are also given. Always use the easier method for removing the stain.

| Classification of stains | | |
|---|---|---|
| 1 | Oily stains | Butter, ghee, oil etc. |
| 2 | Animal stains | Egg, blood, milk, meat etc. |
| 3 | Vegetable stains | Tea, Cocoa, Coffee, fruits, honey, Chocolate, etc. |
| 4 | Mineral stains | Rust, medicines, ink etc. |
| 5 | Cosmetic stain | Lipstick, nail polish, scent |
| 6 | Dye & paint stain | Alkaline or aciditic properties |
| 7 | Burn stain | These stains are usually impressed by heating. |
| 8 | Grass stain | Contains alkaline substance. |
| 9 | Sweat | Removable by soap solution and pure water. |

| Stain | Treatments | |
|---|---|---|
| 1 | Butter, ghee, oil, grease stains | • Make powder of white chalk, put stained spot on a blotting paper and pour this powder on it and then after a while, clean it by brush. This process should be repeated for two or three times.<br>• Put blotting paper above and under the stained spot and press it by hot iron. When the oily effect of the stains alights on the blotting paper, change the blotting paper.<br>• If the stains are not removed, sprinkle tetrachloride on the stained spot and clear it by petrol |
| 2 | Paint, varnish stains | • Use kerosene oil to remove a fresh stain.<br>• In case of a old stain, use solution of turpentine oil and methylated spirit |
| 3 | Egg stains | • Pour salt on the stained spot and then spray a stream of water on it.<br>• On woolen garment, apply tartar powder. On removal of stain put a wet cloth on it and press. |
| 4 | Milk stains | • Use soap and cold water. Fresh stain is removed by this.<br>• If stain is old, bleach it in chlorine, stain shall be removed. |
| 5 | Blood stains | • Stained spot should be dipped into salt water. After a while clean it by rubbing.<br>• Make solution of ammonia and water and wash the stained spot by it.<br>• Smear starch paste on woolen garment and get it dried and remove the stain by brush. If stain is not removed, the operation should be repeated. |
| 6 | Tea, coffee stains | • Pour a blade of boiling water on the stain<br>• This stain is also removable by using salt and lemon.<br>• Light solution of sodium perborate and hydrogen is also poured on the stain. |
| 7 | Fruit and honey stains | • Wash with soap and cold water. Then pour water blade on the stain from one foot height. |

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| | | |
|---|---|---|
| | | • Smear lemon juice on the stain and get it dried in the sun then bleach .<br>• Give hydrogen steam on the stain, it shall be removed. |
| 8 | Rust stains | • Give water steam to the stained spot and wash it.<br>• Rub lemon juice on it.<br>• Spread the stained spot in a plate. Make a oxalic acid sack dip it into water and put on the stain. Don't let the spot dry. This should be done in open sun. The process may be continued till the stain is removed. Mix one teaspoonful oxalic acid into three big spoons of hot water<br>• Apply turpentine oil on woolen and silk garments. Clean the spot after a while. For removing the smell of turpentine oil the garment should be dried on open sun. |
| 9 | Ink stains | • Absorb the wet stain into blotting paper. Then wash it by soap and cold water. Put it into curd for half an hour. Take care curd does not dry. Immediately then again wash the stain by soap and cold water.<br>• Dip the stained spot into light ammonia solution. Then wash it by water.<br>• Woolen and silk garments should not be rubbed too much, therefore stains on then should be removed by applying equal amounts of hydrogen peroxide and ammonia on them.<br>• In cotton cloth, stains of this type are also removed by applying unripe tomato juice. |
| 10 | Medicine stains | • It is removed by using of hot water and soap<br>• Old stains are removed by dipping it into the solution of methyl alcohol and surgical spirit<br>• Clean delicate and woolen garments by methyl spirit only |
| 11 | Grass stains | • Use hot water and soap. Then spray hydrogen peroxide.<br>• Dip the stained spot into the solution of ammonia and water. After a while wash it by cold water and soap.<br>• Use methyl spirit on woolen and silk garments<br>• These stains are also removed by kerosene oil and alcohol. It is spread in the open sun to remove the small of kerosene and alcohol. |
| 12 | Scent stains | • At times scent stains are also caused on the garment due to some mistakes. For this use methyl spirit. Smear it on the stain and keep open for a while. When the stain is removed, wash it by soap and water. |
| 13 | Burn stains | • Application of hydrogen peroxide on the stain shall also remove it.<br>• Its stains are also removed by washing it in the ammonia acid. |
| 14 | Lipstick stains | • These stains are removed by methylated spirit. When the stains are removed, wash the garment by soap and water. |
| 15 | Nail polish stains | • Nail polish stains are removed by acetone.<br>• Old stains are also removed by applying sodium hydrogen sulphate bleaches. |
| 16 | Boot polish stains | • This stain is removed by using methyl spirit.<br>• This stain is also removed by using turpentine oil and petrol. |
| 17 | Machine oil stains | • Stains on woolen and silk garments is removed by oil and petrol and dried in the sun.<br>• In case of a cotton garment, the stain is dipped into a solution of ammonia or carboric acid. Then it is properly washed by cold water. |
| 18 | Wine stains | • First wash it by cold water only. Then apply salted water or boric acid on it to remove the stain.<br>• Apply hydrogen steams on woolen garments. The stains shall easily be removed. |

# Quality control

**Objective:** At the end of this lesson you shall be able to
**• explain about quality control.**

### Quality

Quality can be defined as a combination of various characteristics or properties of a product which make that product usable and gives customers satisfaction.

### Quality control

The operational techniques and the activities used to fulfill requirements of quality is called as quality control.

### Purpose/Importance/Benefits of quality control

1 Quality control is used to the quality of the product.

2 Quality control is used to increase the production indirectly. If the quality of the product is poor. Then it will also affect the production process while applying corrective steps.

3 Quality control impresses the product quality which will help to get the orders in feature.

4 Quality control used to give complete satisfaction to the customer by giveing qualified product.

5 Quality control used to increase the profit and demand of the product by making them with perfection.

### Inspection

Activities, such as measuring examining, testing, gauging one or more characteristics of a product or service and comparing these with specified requirements to determine conforming is known as "Inspection".

### Need and plan of inspection

Inspections are used to control the quality. Inspection plans means in what method we are going to conduct inspection for the particular product/garment.

### Types of inspection

In garment industries, there are three types of inspections. They are,

1 Raw material inspection or fabric inspection

2 In process inspection or stage inspection

3 Final inspection

### Raw material inspection(Fabric Quality Control (FQC))

### Importance of fabric quality control

1 If the fabric having full of defects and faults, as a raw material it will affect the total production.

2 The defective fabric leads to most of rejected garments and that leads to rejection of the order.

3 Defective fabric defects affects the production and quality, which consumes more time for production.

4 Defective fabrics affect all the process from cutting to packing.

5 Future orders will be spoiled by the more fabric defects.

### Fabric inspection

1 In garment industries, the quality of received fabric is found out by fabric checking.

2 For that, they are using fabric inspection machine to check the fabric.

#### Fabric inspection machine

- This machine is used to inspect the fabric quality.
- Here, the fabric is unwound from a beam and being wound on other other beam.
- In the middle, the fabric is moved on a glass table which is having a series of tube lights.
- With the help of the brightness, one can visually check the fabric and can mark the defects by placing necessary colour or arrow stickers.
- A counter is also used to know the number meters been checked or wound the fabric winding roller.

3 They are normally following 4 point system to value the fabric either to be passed or rejected.

4 The defects are classified to major defects, minor defects and damages. According to that they are deciding the fabric to be passed or rejected.

5 They use different colour stickers to know the types of adult or defects like major, minor, damages or stain for easy identification.

### 4 Point system

In this system, according to the length of the defect the points are alloted. They are,

**Defects**

upto 3" - 1 point

upto 3" - 6" - 2 points

6" - 9" - 3 points

Over 9" - 4 points

**Holes and openings**

1" or less - 2 points

Over 1" - 4 points

Here total defects/100 sq.yards is calculated and normally those fabric rolls contain more than 40 points per 100 sq.yards are considered as "Rejected". By this system, the checked fabric is passed or rejected. This is the widely followed system in garment industries. This is suitable for knitted fabrics also.

### Common fabric defects

1 Weft bar : Weft bar is a band running weft-wise across the full width of the cloth.

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2 Weft crack: It is thin place or missing weft across the body of the fabric.

3 Thick and thin places: These are similar to weft bar but unlike weft bar it repeats at intervals.

4 Weft loops : When a small portion of weft is caught by warp threads and that portion of the weft forms loops. This is seen on one or both sides of the cloth.

5 Box marks : Box marks are seen on the cloth as a result of something brushing or staining the weft while it is in or near the box.

6 Missing ends : Absence of warp ends at this proper place in fabric is termed as missing end.

7 Floats: Improper interlacement of warp and weft ends in the fabric over a certain area is known as float.

8 Broken picks/double picks : The partial pick inserted in the fabric because of weft break/exhaustion is called as broken pick.

9 Lashing-in : It is the lenght of weft yarn that has been pulled mistakenly into the shed during weaving.

10 Temple marks : These are in fabric because of the incorrect setting of the temple rollers.

**In process inspection/Stage inspection**

**Quality control in spreading**

1 Check whether the lay is compact and without wrinkles.

2 Line matching of the lay should be inspected.

3 Check the number of pattern pieces, sizes and pattern direcitons of the layout.

4 Check the pattern grain and fabric grain quality.

5 Check the marking quality.

**Quality control in cutting**

1 The cut component should be properly matched with the actual patterns.

2 The cutting parts should not have serrated or frayed edges.

3 Check the parts are correct without any over or under cut.

4 Check the portions of the notches and drills.

5 Check the fabric grain of the cuts.

**Quality control in sewing**

1 Check the garments having proper measure with specifications.

2 Check the garments have defects free. These should not have a.Sewing defects (miss stitch, puckering etc.) b. Seaming defects (Raw edges inside closing, puckering in seams, etc.) c. Assembly defects (Collar middle variation, sleeve up and down etc.)

3 Check the fasteners, trims, labels and their position and placement.

4 Check the garments frequently at the primary, middle and final stage of the sewing process.

5 Check the quality of stitches, SPI and other details like embroidery works, decorations if any.

**Quality control in finishing**

1 Check the quality of pressing and the garments should be wrinkle free.

2 Check the garments are trimmed well without any protruding threads.

3 Check the garments are free from stains.

4 Check the quality and position of the individual piece packing materials.

5 Check the folding quality of the garment.

**Final inspection**

**Final inspection process**

1 Check the quality of the cartons and presentations. Check the type and method of packing.

2 Check the quality of the presentation and trimmings.

3 Check the measurements of the garments.

4 Check the garments free from raw material defects and sewing defects.

5 Check the appearance and drape of the garments.

**Different techniques or methods of final inspection**

The main purpose of inspection is to decide whether the garment lot is to be passed or rejected. An out of the total bulk quantity of garments, we cannot decide that how many garments to be inspected. The following are the different techniques.

**a No inspection**

No inspection means the lot is passed without inspecting even a single piece of garment. If it is a defective lot, it will create the buyers' and customers' dissatisfaction.

**b 100% inspection**

100% inspection means each and every garment of the lot is thoroughly checked. It is the best method but it will consume more time.

**c Spot checking**

This method consists of inspecting random shipments. In this method, the lots are checked randomly without any idea. By this, there is a chance or stopping some defective materials and it is only partially effective.

**d Arbitrary sampling**

In this method, some part of the shipment(normally 10%) is thoroughly checked and decided whether the lot is passed or rejected. But this, percentage(10%) not suits for all the orders. Sometimes, it leads to wrong decision.

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**e Acceptance sampling/Satistical sampling**

This method is also called as "Statistical Quality Control" (SQC). The application of satistical techniques to control the quality is known as "satistical Quality Control". It is mainly based on the AQL preferred by the buyer. AQL is known as Accepted Quality Level is maximum percentage of defective accepted by the customer or buyer.

In this method, statistics or norms are set according to the order quality. An example for set norms has been given below.

| Sl. No. | Order Quantity | No. of pieces to be inspected | Defects - Major/Minor |
|---|---|---|---|
| 1. | 1 - 50 Nos. | 10 | No defect |
| 2. | 50 - 100 Nos. | 15 | 1 minor |
| 3. | 100 - 500 Nos. | 35 | 1 Major / 2 Minors |

By these norms, the lot is passed or rejected. But these norms will vary according to the buyers and company. This is a suitable and widely used method and based on the AQL % of the buyers.

**Duties and responsibilities of a quality controller or quality supervisor / Role of inspector**

1 He is responsible for getting from the production.

2 He should check the manufactured pieces that whether they are having required quality.

3 He should solve the quality problems if any.

4 He should avoid the quality related problems before occurance.

5 He should teach the work properly to the labour if necessary to avoid the future quality related problems.

6 At the same time, he should cooperate with the production supervisor for manufacturing the products within time.

7 He should be sincere and punctual.

8 He should be a hard worker with loyalty to the industry.

9 He should predict the quality related problems well in advance and should take the precautionary measures properly.

10 He should prepare the quality reports frequently and submit to the superiors to know the actual quality status.

**Note 1 :**

- The quality of hand tools may be suitably increased as per the number of supernumeraries admitted in a unit.
- Trainees tool kit may be treated as consumables in respect of trainees actually completing the course of one year (both the semesters) duration.

**Note 2:**

- Due to the rapid changes in the technologies frequent moderization of equipments and technologies is necessary.
- Training programme for staff should be organized in the new fields added in the curriculam for the proper implementation of the same.
- Experts from the industry may be called for special lecturers and demo's as and when required.

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